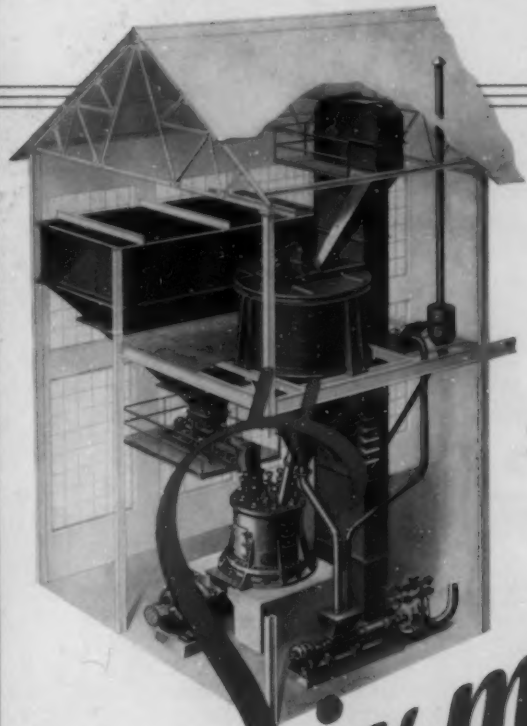
Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

JUNE, 1940



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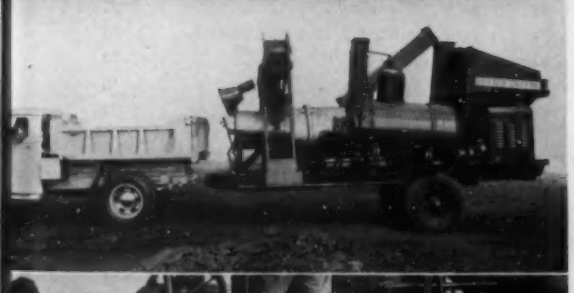

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NEXT MONTH'S ISSUE

As usual outstanding articles will appear in the July issue dealing with current problems in the cement, aggregates, and concrete products industries. Reclaiming stockpile material and the question of dry cleaning vs. washing will be discussed by a well-known engineer identified with a progressive California company. An interesting installation of stack dust collectors in a cement plant will be described and illustrated. Methods of merchandising ready mixed concrete, concrete joist manufacture, and an efficiently laid out high-pressure, steam curing concrete products plant will feature this section of the coming issue.

Mr. Nettleton, in the next installment of his series, will tell about quarry operating methods which will help to reduce rejections of material caused by a dirty product, segregation, and inaccurate sizing. In the Shaw installment on sand classification the author describes and illustrates methods of determining graphically the sizes which will be obtained from rising current classifiers. The concluding article of the series by Steven Gottlieb will appear in the Chemist Corner.

Dust Collectors

No subject is of more timely interest to cement plants than the efficient recovery of dust and the proper utilization of the recovered product. A wet-process plant has found a battery of relatively small cyclone collectors very effective in removal of stack dust, and an interesting method of reintroducing the dust into the slurry has been developed.

Modernize Quarry

One of the oldest quarries in the country has kept its plant up-to-date by adding new equipment and changing methods. Three crushing plants of about equal capacity and two quarries are operated as a unit. This is an advantage as the temporary shutdown of one crushing unit for repairs does not close down operations, and it makes possible adjustments to meet varying demands.

Reclaiming Stockpiles

Methods of overcoming faults which are common to nearly all stockpiling are discussed by an authority on this subject. Dry-cleaning as compared with washing, and the most efficient use of equipment and plant layout are described and illustrated with many photographs.

Concrete Products

Laying out a system of transportation and the methods of handling material and finished products are of primary importance in a high pressure, steam curing concrete products plant. The diagrams and illustrations showing how one enterprising manufacturer laid out his plant should be of general interest. Another article will deal with the successful sales methods of a ready mixed concrete producer in promoting the use of this product for house foundations. Concrete joist manufacture, speeded up by the use of electrically generated heat applied uniformly throughout the concrete mass, is a subject of unusual interest to be discussed in the coming issue.

ROCK PRODUCTS

RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

With which has been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 43, No. 6

Contents for June, 1940

Why not discuss an economics of business?—*Nathan C. Rockwood* 21

Grinding for high surface at Nazareth Cement Co.—*Bror Nordberg* 22

Speed up quarry haulage—*Ralph S. Torgerson* 25

Screenings plus bank sand makes good concrete sand 27

Simple launder pockets to grade sand—comments on Edmund Shaw's sand classification articles 29

Plant testing pays dividends—Part 15 on crushing, sizing, testing and specifying aggregates.—*Elwood T. Nettleton* 31

Convert rock dryers from gas to coal 33

Surge storage reduces shutdowns 35

Gypsum operations in Great Britain—*Dr. James Watson* 38

Sand and gravel watchman collects—important U. S. Court decision under wages and hours act 40

Seek light on lime—National Lime Association's 38th annual convention developed a lot of information—*Nathan C. Rockwood* 42

Lime kilns like battleships—*Victor J. Azbe* 47

Fluxes and their influence on burning clinker—Article two—comparative results in shaft and rotary kilns—*Steven Gottlieb* 49

Low and High pressure curing 58

Reaching ready mix markets 61

Departments

Concrete Products 57

Editorial Comments 21

Hints and Helps 52

Index to Advertisers 96

National Association Activities 54

New Literature 81

New Machinery and Equipment 55

News of the Month 70

Personalities 48

Traffic and Transportation 83

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EDITORIAL STAFF—Nathan C. Rockwood, Editor; Ralph S. Torgerson, Managing Editor; Bror Nordberg, Associate Editor; Frank Richter, Assistant Editor.

CONTRIBUTING EDITORS—Victor J. Azbe, St. Louis, Mo.; Dr. F. O. Anderegg, Newark, Ohio.

FIELD REPRESENTATIVES—A. B. Maynard and C. P. Teats.

ADVERTISING REPRESENTATIVES—Richard M. Ward, Eastern Manager, 522 Fifth Ave., New York City, Tel. Murray Hill 2-7888; George M. Earnshaw, 2123 East 9th St., Cleveland, Ohio, Tel. Main 9645; Louis C. Thaon, Western Representative, Chicago office, Tel. Harrison 7890; and Don Harway and Co., West Coast Representative, 155 Montgomery St., San Francisco, Calif., Tel. Exbrook 6029, and 318 W. Ninth St., Los Angeles, Calif., Tel. Tucker 9706.

BUSINESS STAFF—George C. Williams, Vice-President and General Manager; Ralph G. White, Advertising Manager; and L. V. Rodda, Circulation Manager.

LONDON OFFICE—Donald F. Hunter, Manager, 2, 3, 4 Cockspur St., S. W. 1. England.

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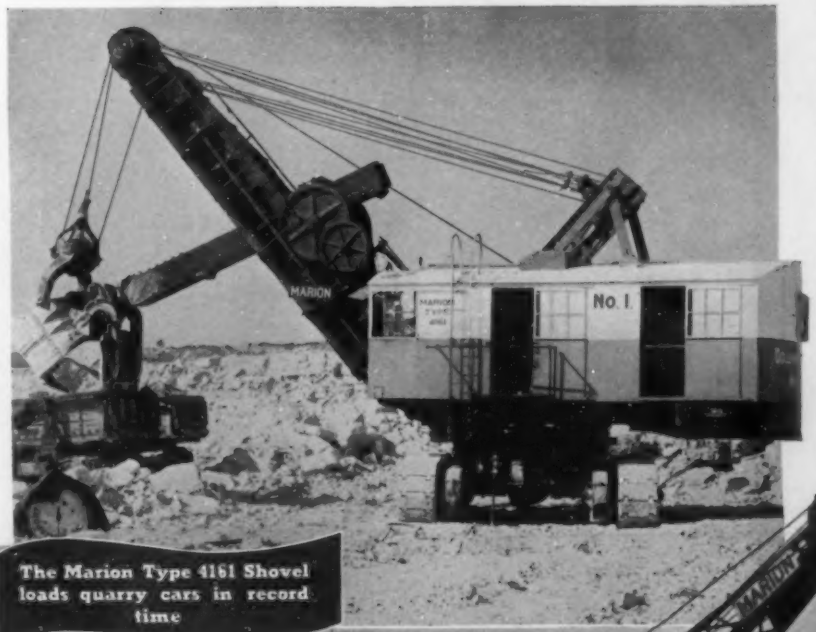

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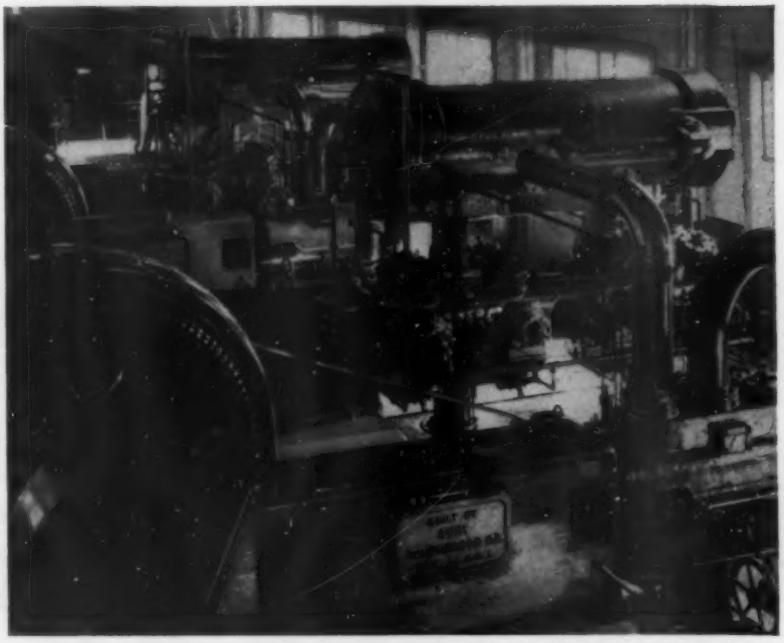

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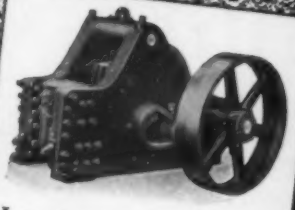

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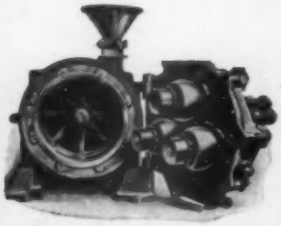

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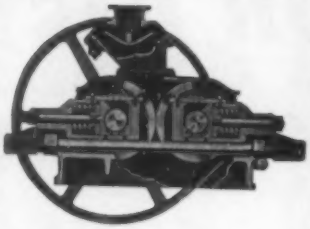

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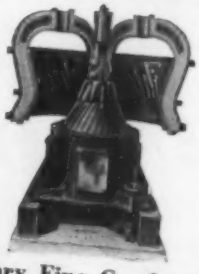

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WHAT is the Cement Industry thinking about??

WATCH *for the* AUGUST CEMENT NUMBER for the complete answer!!

All the editors of ROCK PRODUCTS have been out in the industry's plants, digging for facts, and have found them. Every section of the country has been covered. Plants from the oldest to the newest, the largest to the smallest, have been combed for details.

The keenest minds in the various branches of the industry are contributing their full share. Equipment manufacturers are providing the latest information about their newest developments which help solve the industry's most pressing problems.

Most important of all—the USERS of cement are telling what they expect and why.

This invaluable mass of vital information is being assembled, coordinated and interpreted so that it will be thoroughly practicable and intensely interesting. Briefly, the August 1940 issue will be

THE GREATEST CEMENT ISSUE OF ALL

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3 It will open doors to executives that ordinarily do not see machinery and equipment salesmen and make it much easier to get orders.

4 The 100% coverage of the August Issue of ROCK PRODUCTS makes it the best medium for reaching the cement industry.

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1. THIS STORY begins with Hercules undertaking research to provide quarrymen with an explosive combining safety, economy, and efficiency.

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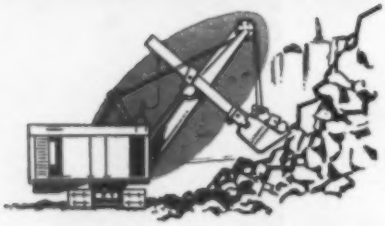
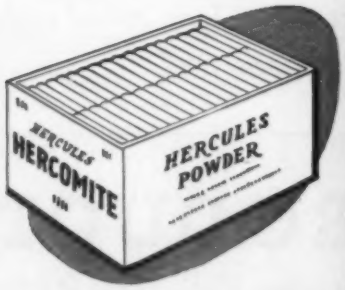


4. THE WIDE RANGE of bulk strengths of the Hercomites filled the operators' need for good breakage at low cost in all kinds of rock.

5. OPERATORS were enthusiastic as Hercomite demonstrated an average saving of 15% in blasting costs, and better breakage, too.

6. MILLIONS of pounds have been shot, and we have no record of a premature explosion caused by explosives of the Hercomite type.



7. TODAY, as a result of this pioneering and research by Hercules, the Hercomites are the standard explosives for quarrying.

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When you study the Lorain-80's construction, the reasons for its outstanding performance are obvious. The burly, all-welded steel shovel boom has "strength" written all over it. Double Center Drive design of turntable brings engine power out of hiding, applying it directly where and when you want it. And the big Center "Chain" Drive crawler carts this heavy duty unit cross-country or in and out of tight spots with unbelievable ease and speed.

If you want a 1¾-yd. shovel that's new in design and construction yet thoroughly proved from the standpoint of performance, the "80" will fill the bill. Write today for illustrated catalog.

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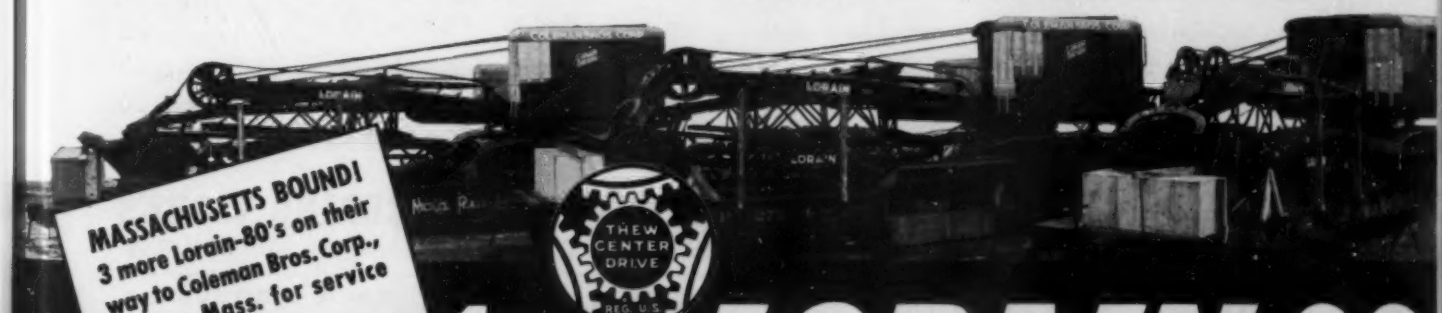

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1¾ YD. LORAIN-80

PIONEER
Foto Facts
No. 8

Ernest Loyd, Contractor, of Fort Worth, Texas, realized that he could crush more rock and make more money if he could feed his primary crusher more efficiently. The entire operation of his plant was being delayed because big rocks would bridge over and not go into the crusher . . . because large rocks had to be forced in with crow bars . . . because he did not have control of the feed and first the crusher was choked and then it ran empty . . . and because small material went thru the crusher.

QUARRY PLANT PRODUCTION *increased by* TRAVELING GRIZZLY FEEDER

To answer these problems, Ernest Loyd selected the New Pioneer Traveling Grizzly Feeder, mounted on a truck to feed his 24 inch by 36 inch Pioneer Primary Jaw Crusher.

The feeder has a platform twelve feet wide and ten feet long so a whole truckload of rocks can be dumped at one time. The feeder consists of a series of bars which convey the big rocks to the crusher but allow the small material to fall thru and go directly to the conveyor under the crusher. The feeder is controlled by a clutch on the operator's platform so the crusher can always be kept full without choking and there is no bridging over to leave the crusher empty.

When rocks that are too big for the crusher are dumped on the feeder, the clutch is thrown out, the feeder stopped, the rock is broken with sledges, and the feeder started up again with no delay to the crusher. A quarry plant can only produce as much material as is fed to it and the amount fed to the plant depends first on the feed to the primary crusher.

The operator on Ernest Loyd's crushing plant estimated that they had increased their production between 20 and 25% by using the Pioneer Traveling Grizzly Feeder.

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You can't prevent the production of dust. You *can* collect it and prevent its dispersion. Get it at the source. Protect your plant, equipment and product. Enhance your good will.

Then consider dust selfishly. Find out if your plant is blowing money up your stacks in fugitive values. Smelters made that discovery—and now save millions of dollars a year in gold, silver and lead that was formerly gone with the wind—in fume.

Thousands of similar cases are written in the history of the Cottrell Process of Electrical Precipitation. For 34 years, Cottrells have been the only type of equipment that can—and does—collect anything suspended in any gas—solid or liquid—red hot or ice cold—wet or dry—irrespective of particle size, and to any desired efficiency. Cottrells are available for all industries, in any capacity from a few hundred c.f.m. to millions.

Where the exceptionally high efficiency of Cottrells is not required, Multiclone Mechanical Collectors provide economical dust recovery down to the lower micron sizes. Multiclones are all-metal, compact, fireproof and have nothing to clean, repair or replace. They have the highest efficiency in proportion to space occupied and power input. In addition to their wide application for plant clean-up and ordinary dust control, Multiclones collect fine powders from spray dryers and other manufacturing processes. Made for any gas volume and particle concentration.

COTTRELLS IN THE CHEMICAL INDUSTRY

Ahead of contact mass in acid plants, Cottrells remove the last traces of acid mist, arsenic and other impurities from the SO_2 gas stream after cooling and preparatory to its entering the drying towers. In the oil refining and other process industries, Cottrells collect the acid content that is carried as mist in the reconcentrating exit gases from sludge acid recovery. Other applications of Cottrells include the collection of carbon black, phosphoric acid, etc.

Two new booklets are offered to executives—The Cottrell Process of Electrical Precipitation, and Multiclone Dust Collectors. Either or both free. Write today.

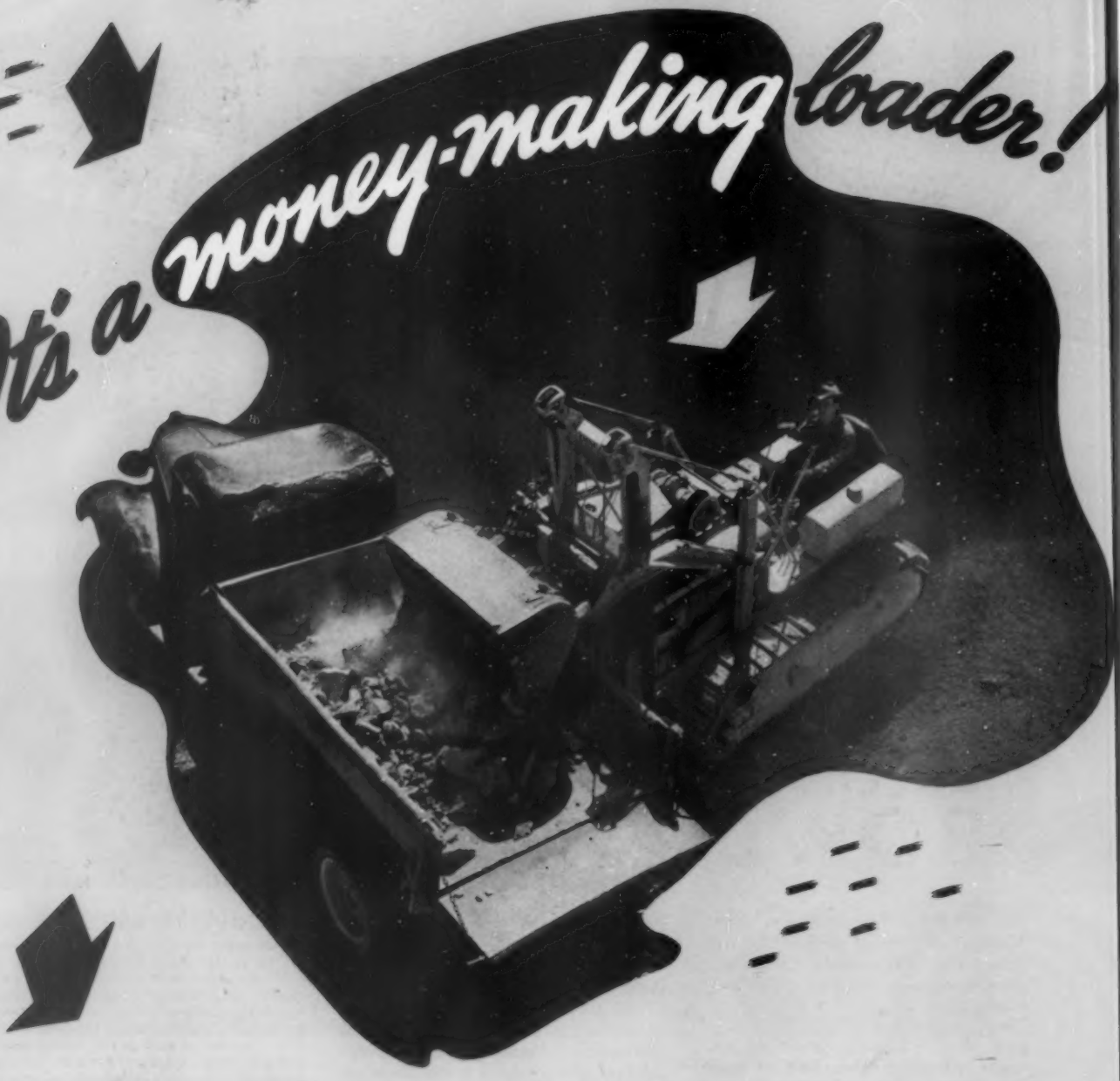
Designers and builders of the only complete line of electrical and mechanical equipment for the control of dust, fog, fume and mist.

WESTERN PRECIPITATION CORPORATION
1016 W. NINTH ST., LOS ANGELES, CALIF. • CHRYSLER BLDG., NEW YORK

PRECIPITATION COMPANY OF CANADA, LTD.
DOMINION SQUARE BUILDING, MONTREAL, P. Q.

COTTRELL ELECTRICAL PRECIPITATORS
MULTICLONE MECHANICAL COLLECTORS

It's a money-making loader!



HERE'S one of the *handiest* . . . most *versatile* . . . and *profitable* machines you can invest your money in!

It's a "Caterpillar" Diesel D4 Tractor with a Trackson Traxcavator . . . low in first cost . . . economical with fuel . . . and adaptable to so many kinds of work that it's an all-around, general "handy man"!

In other words, when it isn't high-shoveling material into trucks and wagons, this outfit can turn-to at mixing, supplying crushers, cleaning up, excavating, scraping, ripping and hauling. (It has a drawbar like any other "Caterpillar" Diesel Tractor; and a bulldozer can be attached in a matter of minutes!)

The outfit shown is owned by Chaffin & Jenkins, of Provo, Utah. Loading out gravel in a lime quarry, it shuttles between stock-pile and haul-trucks . . . *handling 60 tons an hour!* And when it comes to cost, you can figure that this size "Caterpillar" Diesel usually needs only about 1½ gallons of low-cost fuel an hour!

See your nearest "Caterpillar" dealer, or write direct to the factory for more information on this "Caterpillar" Diesel D4 Tractor with a Trackson Traxcavator.

CATERPILLAR TRACTOR CO., Peoria, Illinois

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES AND ELECTRIC SETS • TRACK-TYPE TRACTORS

INDUSTRY puts its Seal of Approval on the Raymond BOWL MILL

These figures speak for themselves, and for the Bowl Mill: Five years on the market . . . over 300 installations averaging better than one per week . . . 30% repeat orders . . . mills operating in 27 states, and 4 foreign countries . . . firing rotary kilns, furnaces and boilers. That is what industry thinks of the Bowl Mill in terms of purchases.

BOWL MILL

Producers of lime and cement can profit by the use of the Bowl Mill because of its ability to handle any grade of coal . . . maintain uniform fineness . . . give better control over the coal-air mixture . . . improve kiln operation and reduce coal preparation costs 30% to 60% as compared to the central bin system.

Be sure to investigate this modern method of direct firing rotary kilns. Write for catalog, which describes the unique principle of pulverizing without metal-to-metal contact between the grinding elements . . . the easy adjustments and automatic lubrication . . . the quiet operation, power economy and record low maintenance of less than 1¢ per ton of coal ground.

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1307 North Branch Street CHICAGO
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

WHO SAID "Wire Rope Reeving Isn't Important"?

BEFORE

4" rollers at reverse bend. Rope service unsatisfactory.

AFTER

17" sheaves replaced the 4" rollers.

RESULT **Rope Service almost Doubled!**

This is an *actual* case history. Not an isolated case. But a typical example of what can be and is being done to increase rope life through proper wire rope reeving.

There is nothing complicated about proper wire rope reeving. It's simply a matter of watching the things that are easily overlooked—avoiding reverse bends whenever possible, making sure that sheaves are large enough, that sheave grooves are in proper condition, etc. The additional examples to the right are typical of what can be done. And they pay big in results.

To obtain maximum safety and service from wire rope—watch wire rope reeving. And feel free to consult our local representative—who will gladly make available to you our years of experience with every conceivable kind of reeving problem. His suggestions may point the way to worthwhile savings.

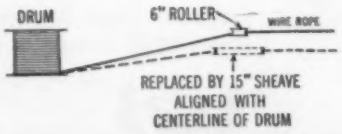
JOHN A. ROEBLING'S SONS CO.
Trenton, N. J. *Branches in Principal Cities*

This advertisement is published in the interest of all wire rope users, to help them obtain greater safety, service and efficiency from their wire rope.

ROEBLING

JAR Wire Rope

SOME OTHER "REEVING POINTERS" THAT INCREASE ROPE LIFE



These simple changes doubled rope life!

Originally, a 6-inch roller was used, as indicated above, in reeving a hoist. First of all, this roller was too small—causing a sharp bend in the wire rope. Secondly, it was improperly aligned—causing scrubbing action of the rope on the drum. As a result wire rope life suffered.

By simply replacing the 6-inch roller with a 15-inch sheave, and properly aligning this sheave, as shown, excessive rope wear was eliminated. Wire rope life was doubled!

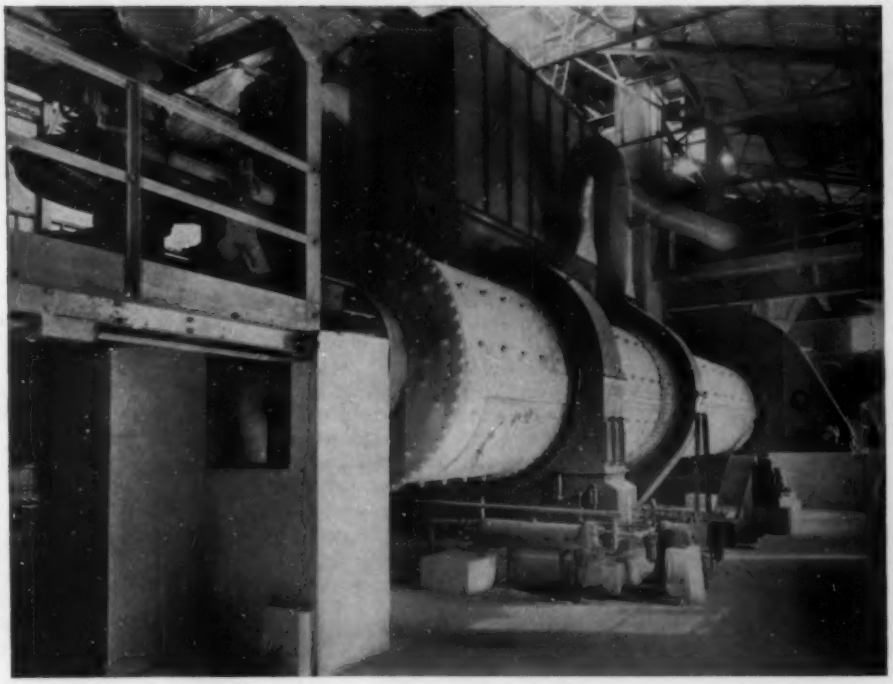
Dragline sheaves replaced —rope life tripled!

An Illinois coal company replaced worn Fairlead sheaves with larger sheaves of harder material. Result—average service of five ropes almost tripled that of five ropes used before.

Ask about **ROEBLING "BLUE CENTER" WIRE ROPE** *... either standard or preformed*

GRINDING MACHINERY

Wet grinding or dry grinding
Open or closed circuit
Gravity discharge or air swept
Combined drying and grinding
Direct firing or bin system



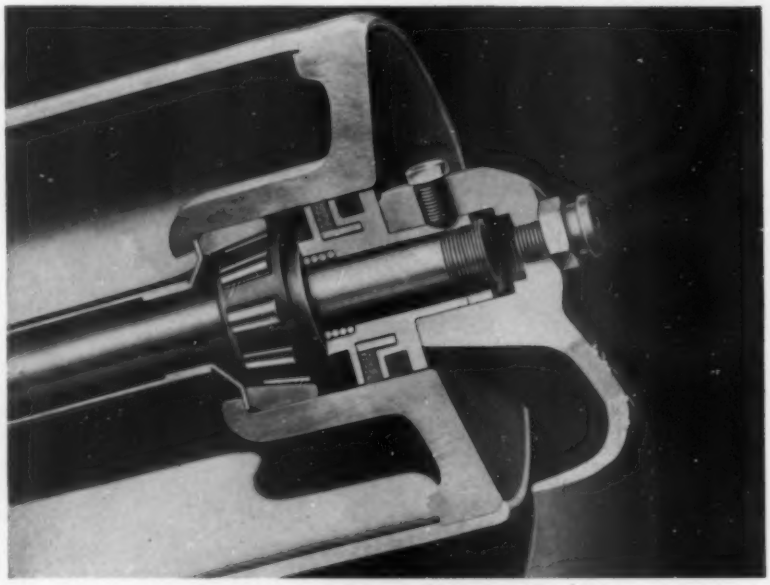
UNIDAN multi-compartment mill, combining granulating and pulverizing.
UNIKOM multi-compartment mill with overhung preliminary grinding chamber.
TIRAX multi-compartment air swept mill for drying, grinding coal, etc.
ATOX air swept high speed, vertical shaft mill for drying and grinding.
KOMINUTER and **BALLMILL** for granulating. **TUBEMILL** for pulverizing.

Also a complete line of accessories for the grinding operation such as air separators and classifiers, Trix wet separator, fans, liners, grinding bodies, spray casings, symetro gear boxes, feeders, conveyors, pumps, dust casings, washmills, etc.

F. L. SMIDTH & CO.

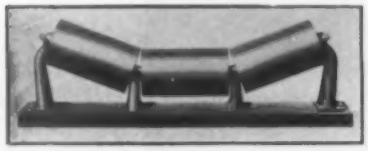
60 EAST 42ND STREET Engineers NEW YORK, N. Y.

IDLERS *that are* DIFFERENT



Bearing and Seal assembly at outer end of idler pulley

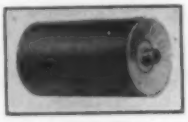
The Robins Improved Troughing and Return Idlers for Belt Conveyors have been completely redesigned for greater strength, longer life and lower maintenance. Every user should



Improved Troughing Idler

study the features of these new Idlers and consider their economic advantages.

The Troughing Idlers have pulleys of 5" or 6" diameter of either steel or one-piece cast iron. A rigid TRUSS construction is used. The pulley shafts are firmly held in malleable iron brackets of streamlined design and crescent section, securely bolted to a strong channel base,—

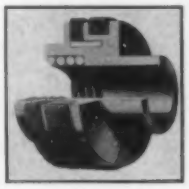


Pulley and Shaft Assembly

the shafts, brackets and base forming a vibration-proof TRUSS.

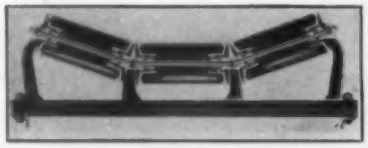
The three Pulley Assemblies are identical. Each is composed of the pulley, its bearings, seals, shaft and lock nuts. Radial and thrust loads on the pulleys are carried by Timken tapered roller bearings, the proper functioning of which is assured by positively locked screw adjustment plus wear-take-up springs.

Complete protection of each bearing against entrance of grit or moisture, or leakage of grease is assured by the triple grease seal in which both cork composition and woven felt washers are combined with a metal labyrinth. The cork and felt rings, free to rotate between the seal flanges, are a tight fit in the bore of the pulley and turn therewith. All Robins Idlers have the patented Single Shot Lubrication by which grease injected at either one of two fittings, located at the ends of the idler in the safest and most accessible location, fills all six bearing chambers.



Grease Seal

The redesigned Return Idler is equally improved. It is exceptionally sturdy and capable and sustaining heavy loads. The pulley with its

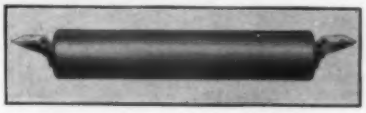


Internal Grease Passage

shaft, bearings, seals and locks is a unit assembly supported by malleable iron brackets. This pulley assembly may be lifted out of the brackets without disturbing the bracket attachment or the adjustment of bearings.

The pulley is made of heavy steel tubing 5" or 6" diameter with cast heads pressed in. Within each head is a Shafer Self-Aligning Roller Bearing, protected by a triple seal same as used in troughing idlers. Surrounding the shaft between the pulley heads is a grease reservoir permitting the lubrication of both bearings from either one of the two pressure fittings.

Robins Improved Idlers are interchangeable with older types of Robins Idlers as well as other makes.



Improved Return Idler

Replace worn Idlers with Robins Improved Idlers. Every replacement thus made is one step toward modernizing your conveying system.

Send for information on Belt Conveyors, Screens, Screen Cloth, Bucket Elevators, Feeders, Weigh Larries, Bin Gates, Grab Buckets, Car and Barge Hauls, Unloading Towers and Skip Hoists.

MATERIAL HANDLING ROBINS EQUIPMENT

ROBINS CONVEYING BELT CO., Passaic, New Jersey

WHY NOT DISCUSS AN ECONOMICS OF BUSINESS?

RECENT "improvers" of the older theories of economics have led us away from first principles without increasing our understanding of our own immediate economic problems. That's why we have persistently advocated the right of producers and manufacturers to discuss *freely* and *openly* the economic problems of their own business. They dare not do so today under our anti-trust laws.

All right, you say, what could be discussed other than the same old problem of over-capacity, proration of production, price fixing? The answer is that we see no good reason to continue to think in grooves just because professional economists do. A little original thinking and discussion by men of business among themselves might develop some constructive ideas.

For example, to throw out something tangible that you can get your teeth into, suppose we go back to fundamentals of business investment. You put up a certain sum as capital; on this you expect an income from interest or dividends; in addition you expect the ultimate return of your capital intact. This may be accomplished by liquidation of the enterprise, or by sale of your investment in it. Since few enterprises are set up to be liquidated voluntarily in a definite period, you depend on the sale of your investment.

With industries like those in the rock products field, producing standardized, staple commodities, the value of your investment fluctuates greatly with the price and volume of the product made. Logically, it seems to us, the value of the investment *should not* fluctuate thus, although it is logical that current return on your invested capital should do so. Why not then set up a system of cost-keeping, on which prices could be based, that might also prevent this fluctuating value?

You say you do this now by a charge-off for depreciation and depletion. But this "surplus" is seldom tangible enough to pay for liquidation were it desired. Moreover, the method employed of charging off a fixed amount in years of small production, the same as in years of large production, is one cause for great differences in unit cost. The differences in unit cost because of differences in percentage of plant capacity utilized, as between you and your competitors, is the immediate cause of cut-throat competition and the mad struggle to get volume at any price.

Suppose now instead of a fixed percentage depreciation and depletion charge regardless of volume, producers were to write off a *unit cost* in *inverse* ratio to volume. (That is, the lower the unit cost on account of volume, the higher the fixed cost.) Say the write-off is now 10 percent per annum of the investment. Suppose Company A is producing at 100 percent capacity and B at 50 percent; A might write off 30 percent and B 5 percent, while another operating at 75 percent (which we will call normal), might write off 10 percent. Obviously this would tend to equalize the whole unit costs, regardless of the temporary advantage of a large volume. Possibly other fixed costs could be similarly distributed as between high and low volume years.

You will say, doubtless, that no matter how the books are kept the producer who takes in the money will have it, while the one who doesn't won't be any better off than he was before. There is no gainsaying that; for the efficient operator will prosper and the inefficient one will not, regardless of bookkeeping. We are not proposing a way to save the incompetent operator; we are proposing a system of pricing based on cost keeping that might prevent radical changes in unit costs due to volume changes.

If, as we believe is the case, the average percentages of plant capacity utilized by all competent competitors tend to equalize over a period of years, this equalization of costs could thus be accomplished without recourse to price wars which result from attempts to equalize percentages of volume to capacity each season. Provision for liquidation (depreciation and depletion) would be made in years when it could be done from profits instead of being, as it so often is, merely a bookkeeping entry. The unprofitable producer still would be eliminated or be compelled ultimately to write down his investment in productive facilities.

Objection will be made, of course, that the Treasury Department would not permit such varying charges for depreciation and depletion. That would not prevent operators keeping their own cost records on such a basis. And, anyhow, the Federal Government is supposed to be much interested in seeing that security holders get a fair break. If a security holder wants to liquidate there should be some assurance that his company has provided assets to make it possible. The assets would be in cash reserves (book values) and not in market estimates of earning power.

Others may have thought along a similar line and rejected the idea as impracticable. We haven't read or heard about it. We merely put it forward as an example of the kind of subject that might be discussed by groups of business men, did they feel free to discuss cost and price philosophy *freely* and *openly*.

Nathan C. Rockwood

Grinding—For High Surface

By BROR NORDBERG

WHILE CEMENT MILLS generally have been changing clinker grinding methods, at least one plant, the Nazareth Cement Co., Nazareth, Penn., has stabilized its grinding operations and does not see any immediate need for changes. Its present grinding arrangement is not new, but it has ample flexibility for the production of different cements.

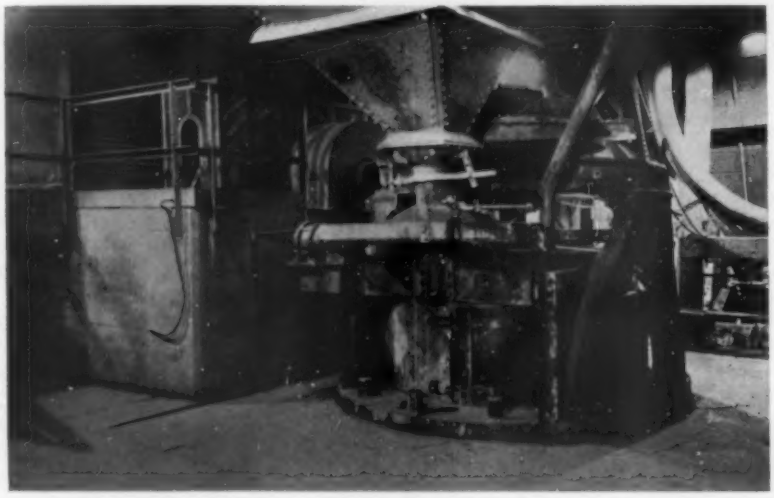
Standard cement and variations of standard cement are being tube-milled in open circuit, with air separation used only for high surface cements. Pneumatic pumps are used not only for placing cement in storage but also to convey the tube mill discharges into the air separators and to return separator rejects for further milling.

In 1932, grinding of high early strength cement was started in open circuit, and the tube mills were cooled by water sprays. Later, air separators were installed, and the present installation has been operated without change for three years.

Preliminary Grinding

Preliminary grinding of clinker, for all cements, is done with Bradley Hercules mills closed-circuited with Hum-mer vibrating screens, and certain changes have been made in the mill internal screens. The clinker is very hard burned, and is aged or cooled to an average temperature of about 150 deg. F. before grinding. Gypsum and clinker are proportioned over Richardson scales into the two Hercules mill bins, and a 2½-mesh internal screen is used when grinding cements of ordinary finenesses.

Using this screen opening, the mill product averages 22.7 percent minus 200-mesh, 28.8 percent through 100, 36.6 percent passing the 50-, and 55.5 percent through the 20-mesh. After being elevated and put over eight 4- x 5- ft. Tyler Hum-mers having 10-mesh wire, the throughs have the analysis: 37.7 percent minus 200-mesh; 47.3 percent minus 100; 59.4 percent minus 50; and 86.0 percent through 20-mesh. This is the feed for the tube mills. The tailings have 93.5 percent minus 6-mesh; 49.3 percent minus the 10; 8.6 percent minus the 14; 2.8 percent minus the 20; and nothing through the 50-mesh. Tailings are returned to the same mills from which they were discharged. The circulating load between the Hum-mers and Hercules mills is 75 to 80 percent and output is 150 bbl. per mill hour.



Preliminary clinker grinder close-circuited with screens. Clinker is very hard burned and cooled to a temperature of 150 deg. F. before grinding

Tube Mills in Open Circuit For Standard Cement

The feed for the tube mills from the Hum-mer screens is conveyed by a drag chain and divided into eight tube mill hoppers from which the feed is introduced axially through trunnion (screw) feeders. The trunnion feeders are driven through Link-Belt PIV gear drives, with a 4:1 ratio of speed variation, which are control units that contribute greatly toward the flexibility in operation of the mills when manufacturing several cements.

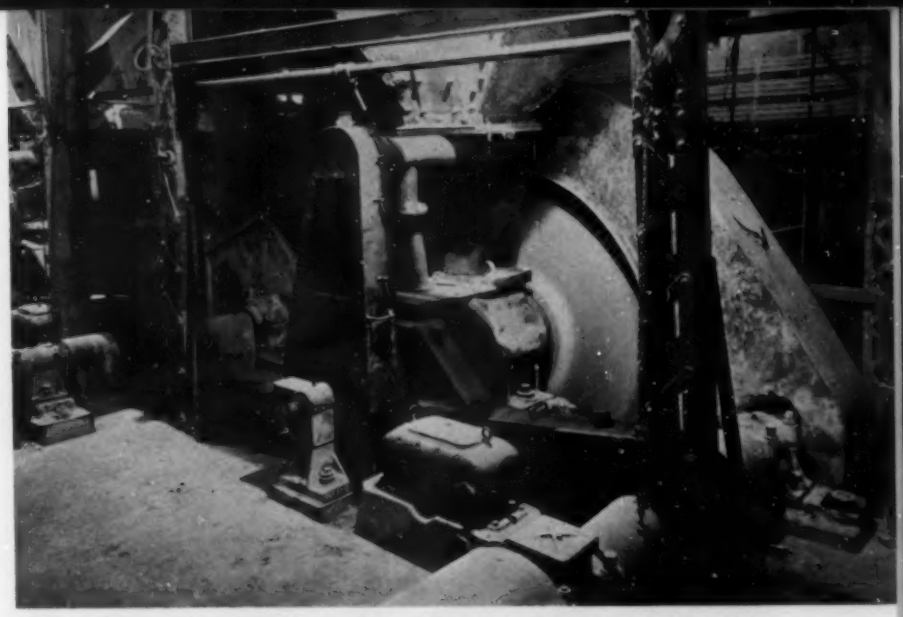
Eight 5½- x 20-ft. tube mills, in open circuit, can grind more material than is produced by the preliminary mills. Standard portland cement, at 1600 sq. cm. per gram or 92 percent through 200-mesh, is ground at the rate of 45 bbl. per mill hour. The mills contain 20 tons of ¾- ⅜-in. steel balls. In making cements of ordinary fineness, the tube mill discharges are gathered into a hopper over an 8-in. Fuller-Kinyon pump, and are pumped into the stockhouses. Over the pump is a 4- x 5-ft. Hum-mer screen with 2½-in. rectangular openings to protect it from receiving extraneous material from the mills.

Cements of special compositions, such as high-silica, high-iron, modified cement and cement of unusual color requirements are clinkered at the proper temperature and ground either in open or closed circuit to the specified fineness. The drive on each tube mill (peripheral discharge) is changed to accommodate open or closed circuit grinding by simply resetting an indicator at a predetermined point to slow up or speed up the screw feed.

Five hours are needed to change the mill over from standard grinding practice to high surface grinding with air separation, and the reverse.

Pneumatic pump takes the place of elevators in returning tailings to tube mills

Pneumatic pumps place cement in storage, convey tube mill discharges into air separators, and return separator rejects for further milling. Air separators are only used when grinding for high surface cements.



Feed end of finish tube mills, showing the method of feeding. Gear drive is variable speed which is important in regulating feed for various finenesses

Changes are made in the screen openings within the preliminary mills and on the Hum-mer screens; and feed spouts or tailings returned to the tube mills are connected.

High Surface Grinding With Air Separation

An 8-mesh screen opening within the preliminary mills is substituted on very fine grinding, and a 40-mesh wire is used on the Hum-mer screens. The mill discharge runs about 58.2 percent minus 200-mesh; 69 percent minus 100; 83 percent minus 50; and 99.5 percent through 20-mesh; and has a surface of about 729 sq. cm. per gram containing about 42.9 percent minus 325-mesh. The distribution of particle sizes according to microns is:

Percent	*Microns*
8.4	0 - 7½
10.8	7½-10
15.8	10 -15
20.9	15 -20
25.1	20 -25

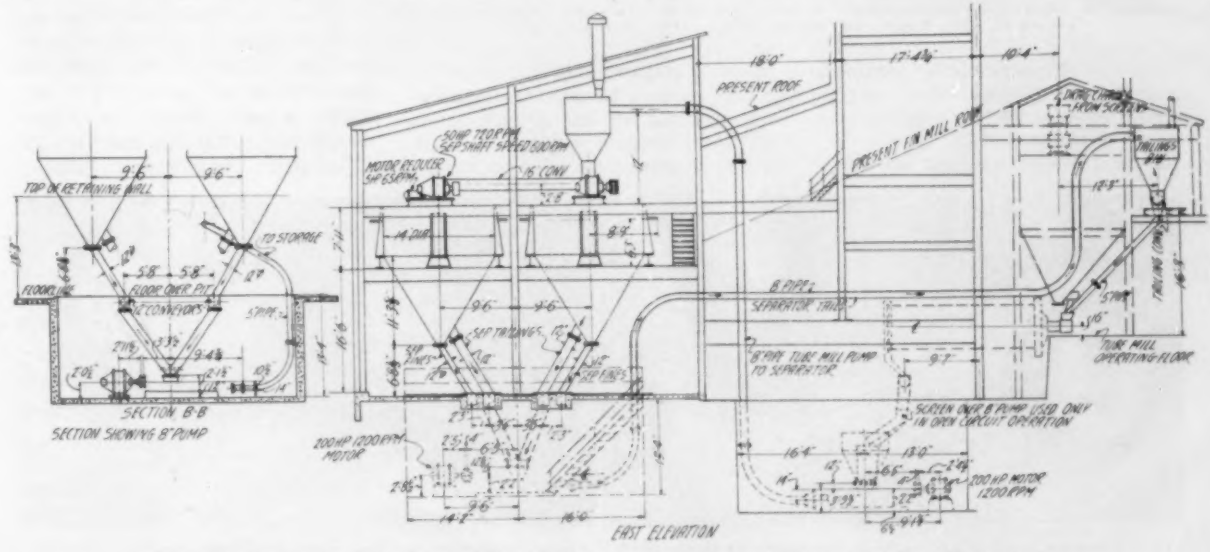
Tailings, which return to the preliminary mills (100 percent circulating load), analyze 5.7 percent minus 200-mesh; 7.2 percent minus 100; 14.2 percent minus 50; 87.8 percent minus 20; and 98.2 percent minus 14-mesh. The fines (tube mills feed material) average 66.7 percent through 200-mesh; 78 percent minus 100; and 91.7 percent minus 50-mesh with a trace through 20-mesh. The surface is about 942 sq. cm. per gram or 58.1 percent minus 325-mesh. Size distribution is as follows:

Percent	*Microns*
9.9	0 - 7½
13.6	7½-10
20.9	10 -15
27.8	15 -20
33.3	20 -25

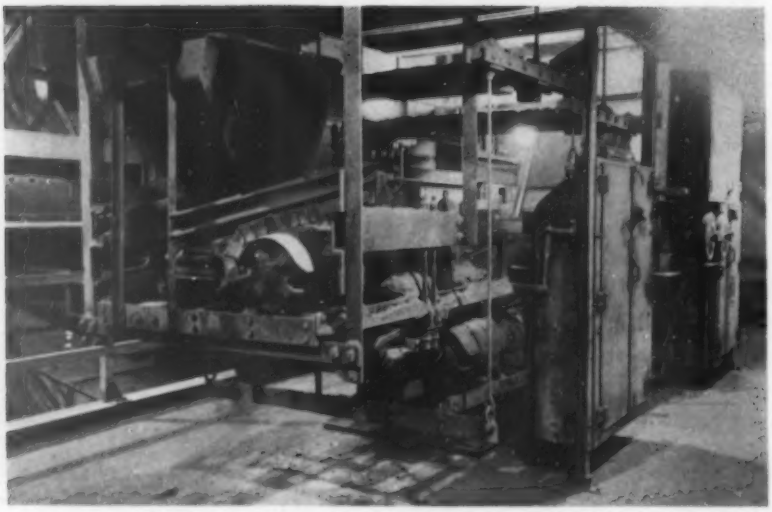
Handling of the tube mill feed material is done in the same way as for standard cement. The product is pulverized to about 2800 sq. cm. per gram, with an output of 18 to 20 bbl. of finished cement per tube mill hour. This compares with 10 to 12 bbl. in open circuit, without air separation and with water-sprayed tube mills.

Air Separation for High Surface Cements

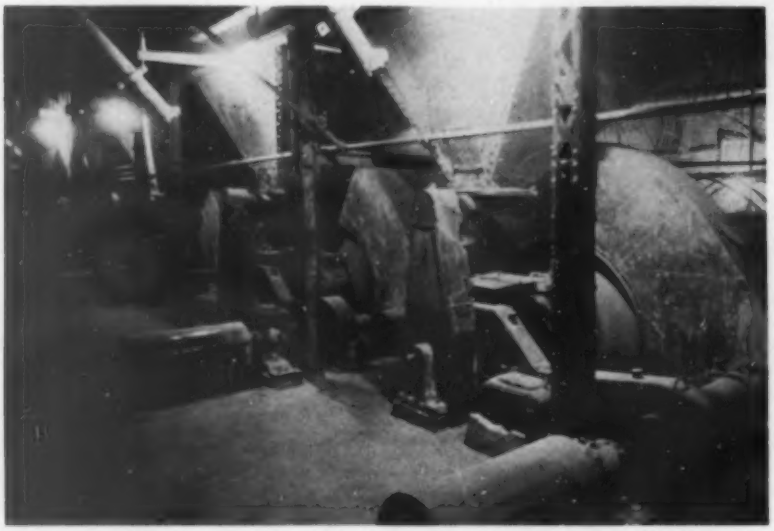
Tube mills are closed-circuited with four 14-ft. Sturtevant air separators. The mill discharges are carried by



Elevation of grinding mill department showing method of handling finished cement and tailings



Gypsum and clinker are proportioned over scales into bins feeding mills



Battery of finish tube mills showing disconnected pipes overhead which are connected to mills when they are in circuit with air separators

screw conveyor to a hopper feeding a 10-in. Fuller-Kinyon low pressure pump, which pumps the material into the air separators.

A surge tank over the air separators, which are arranged close together, receives the pipeline discharge and the load is first divided by a splitter to two pairs of separators and is then re-divided by a slide in a connecting screw conveyor to each separator. The ammeter readings on the air separator drives and other individual checks serve to control the extent of the feed into each separator.

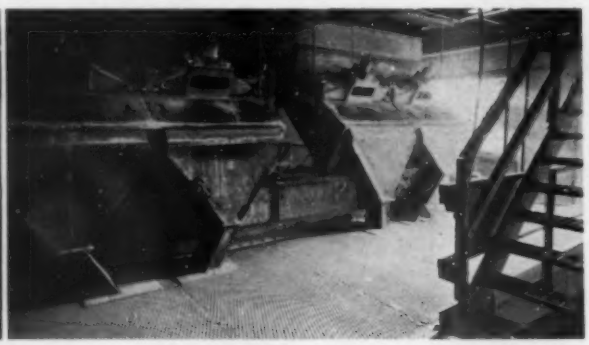
The air separator fines are pumped into the stockhouse by a type B, 8-in. Fuller-Kinyon pump, and the tailings are also handled by pump. At first, the tails were conveyed into the drag chain conveyor carrying the Hummer throughs to the tube mill hoppers. This was not a satisfactory arrangement, as it caused inconsistencies in grinding performance, threw off the chemical analyses, and adversely affected grindability.

Present practice is to pump the separator tails into an independent screw conveyor, dividing them into separate mill hoppers overhead from which they are fed into the mills separate from fresh feed material. When making a run of "Nazco" high early strength cement, sections of pipe are connected from the tailing conveyor to each trunnion feeder and the tails and fresh material are intimately mixed in definite proportions. In this way, the percent of tails to fresh feed is held constant in all mills. The circulating load is held to about 146 percent.

Standard Specifications for Engineering Materials

AMERICAN SOCIETY FOR TESTING MATERIALS has released "Index to A.S.T.M. Standards, Including Tentative Standards," a 152 page book containing information on all of the 885 standards as of January 1, 1940. The index is intended to be of service to anyone wishing to ascertain whether the Society has issued standard specifications, test methods or definitions covering a particular engineering material or subject and to help in locating the volumes in which the standards appear. Copies will be furnished without charge on written request to A.S.T.M. headquarters, 206 S. Broad St., Philadelphia, Penn.

Left: Finished product and tailings are delivered to the floor below for handling by separate cement pumps



Right: Vibrating screens close-circuited with preliminary clinker grinding mills help to reduce the mill load

Speed Up Quarry Haulage

Improvements include new vibrating screens, dust collecting equipment, and construction of road mix plant

By RALPH S. TORGERSON

IT HAS BEEN the policy of the Southwest Stone Co., Dallas, Texas, to bring their plants in line with modern methods and equipment developments just as rapidly as these changes may be made economically.

At the Chico, Texas, plant several major improvements have been made in recent years. These include two 8 cu. yd. RP-10 and one 10 cu. yd. TR-10 Easton-Phoenix semi-trailer quarry haulage units drawn by modern Ford tractor-trucks; the addition of three new vibrating screens and dust recovery equipment; and the construction of an asphalt road-mix plant. With these improvements the crushed stone plant is easily capable of producing 200 tons an hour, and up to 25 different sizes may be made ranging from a dust of 100 minus mesh to rip-rap stone. The asphalt plant also offers a large outlet for crushed stone production.

Above: Modern quarry haulage unit with pneumatic dumping mechanism ready to dump the load. Left: Crushing and screening plant, showing loading out chutes to the left, and to the right, one of the haulage units leaving for another load at the quarry

The quarry is approximately 1700 ft. from the crushing plant, and a very excellent water-bound macadam road 30 ft. wide is maintained for the use of the trucks. This roadway is always kept in good condition, and the quarry floor is as clean as a well-maintained highway. The Easton quarry haulage units handle an average load of 11 tons, and each unit averages 4.5 dumps per hour on a one mile round trip. There is a grade against the load all the way from the shovel to the crusher of about 5 percent for a distance of 800 ft. from the shovel and then tapering off to 1½ per cent the remaining distance.

Present workings in the quarry have a face of about 25 ft. Very little stripping is necessary and is done principally by shovel. Rock is drilled with an Ingersoll-Rand jackhammer sinker drill. For the desired fragmentation in blasting, a 9 ft. by 11 ft. spacing of drill holes, using a 60 percent gelatine dynamite gives the best results. The dynamite house has a capacity of 10 tons.

Near the quarry a compressor house was built, using quarry rock and plant labor, to house a Worthington and an Ingersoll-Rand compressor, both driven by electric motors and furnishing compressed air for the drills.

A pump house contains an electrically-driven centrifugal pump of 6000 g.p.m. capacity and a 400 g.p.m. piston type, pneumatically-operated pump for dewatering the quarry. There is also a 1500 g.p.m. electrically-driven centrifugal pump which is held in reserve.

Separate asphalt road mix plant. Aggregates are dumped into hopper feeding bucket elevator and asphalt is pumped from tanks to the right

Left: Looking down into the quarry, showing two quarry haulage units and electric shovel with 2¼-cu. yd. bucket. Right: Gas-electric switching locomotive

Equipment includes a No. 50 Bucyrus electric shovel with a 2¼-cu. yd. bucket, and a No. 61 Marion steam shovel with a 2½-cu. yd. bucket. In addition to the three modern Easton-Phoenix, Ford tractor-truck quarry haulage units, the plant has in reserve a Mack and two White trucks, each of 5-ton capacity.

Crushing and Screening Plant

Stone hauled from the quarry is dumped into a No. 12 Gates primary crusher by means of a specially designed Easton, pneumatically operated dumping mechanism, shown in one of the illustrations. The No. 12 Gates crusher has a 24-in. opening.

The product of the primary crusher is elevated by bucket elevator, 100-ft. centers, to a 5- x 12-ft. Allis-Chalmers rotary scalping screen with 2-in. round openings. Oversize goes to two secondary crushers, a 7½ style D and a No. 5 Gates. Material scalped out moves by another bucket elevator to a three-deck, 4- x 12-ft. Allis-Chalmers vibrating screen. The product from the top deck and center deck goes direct to bins, and the product of the lower deck is split and fed over two 4- x 12-ft. Allis-Chalmers single-deck screens. Products from these two screens are chuted direct to bins. The three new vibrating screens replaced two 5- x 24-ft. rotary screens and two 3- x 6-ft. vibrating screens.

If a total output of fine products is desired, there is a short 30-in. return conveyor belt that brings any one or all of the products back to either an American Pulverizer unit, a Jeffrey hammermill or a McCully No. 6 crusher for further reduction.

The plant also is equipped with what is known as an Asperator or deduster, a new device made by Sutton, Steel & Steel Co. This unit extracts all the material below 100 mesh, and is so arranged in connection with a 24 in. by 6 ft. Allis-Chalmers vibrating screen that it produces three sizes; 100-mesh down; 20- to 100-mesh; and 10- to 20-mesh.

The Asperator consists essentially of a series of "steps" down which the material cascades to the bottom, the entire assembly being vibrated by means of a shaker vibrating unit. Air is forced through screen openings in the "steps," carrying the dust particles through a duct to a cyclone where the fine material is collected and chuted to bins. The small Allis-Chalmers screen, previously mentioned, separates out the less finer sizes. All equipment units throughout the plant have individual electric motor drives. Motor units are driven by 440 volt a.-c. which is received from the public utility company and stepped down by transformers.

There are eight large bins on tipple, each of 65 tons capacity, two carload loading tracks; and track scales. At each end of the carloading tracks beneath the plant storage bins is an electrically-powered winch for spotting cars under the hinged-type bin gates and chutes.

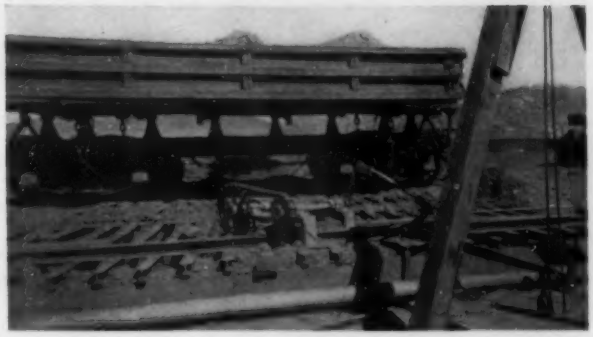
Stockpile storage in various sizes is about 100,000 tons, and the arrange-

(Continued on page 32)

Left: Dust collector for separation of fines. Right: Interior of well-equipped repair shop made by company forces using welded pipe sections for the framing members

Screenings Plus Bank Sand Make Concrete Aggregate

Three crushers, each producing a different size, make crushed gravel independent of pit operation



Lever device regulates flow of soupy material

BELT CONVEYORS are used exclusively for intra-plant transportation at the new plant of Grant-Pacific Rock Co. of Fresno, Calif., built in 1939 at Lindsay, Calif. It comprises a screening and crushing unit, separate railroad loading tipple and separate truck-loading bins, and has a capacity of 135 tons per hr. of washed gravel. The new plant replaces one of smaller capacity owned and operated by the former company, Grant-Service Rock Co., Consolidated, which was taken over by the present company.

The deposit is not unlike that of other California aggregates plants and consists of a heterogeneous mixture with considerable oversize stone, unless it be that water is encountered near the surface which makes operation more difficult. It is estimated that 35 to 40 percent of the pit run material is plus 2½ in. which must all be crushed, and 35 percent is sand.

Convert Dragline Power Unit From Gasoline to Butane Fuel

Excavation is done by a 3-cu. yd. Bucyrus-Erie dragline. This machine had a gasoline engine, but recently this unit was converted to burn butane and with favorable results. Butane is a petroleum derivative which, according to users, gives increased power at very low cost. Commercial butane is a mixture of about 80 percent butane, which has a much higher octane rating than ordinary gasoline, and 20 percent propane.

Both are petroleum gases which are liquefied by pressure for storage and handling in pressure containers but are utilized as gas in the usual way through a carburetor. Butane is obtained in special tanks under pressures of 50 p.s.i. to 100 p.s.i. which must be reduced to atmospheric pressure before being used in the engine. A combination butane-gasoline carburetor mixes the fuel with air and delivers it into the cylinders the same as in a gasoline engine.

At Lindsay, 65 gal. of butane are burned in 8 hr. as compared with 100 gal. of gasoline. Cost of the fuel is about 4½c per gallon as compared with gasoline at 11¾c.

In excavating, the depth of cut is limited to 12-15 ft. under water by a 4 or 5 ft. thickness of clay. Side-dump Western air dump cars of 24-cu. yd. capacity, powered by a gasoline locomotive, dump through a rail grizzley with 12-in. openings into a reinforced concrete hopper tapering to an 18- x 24-in. outlet gate. A reciprocating feeder puts the material on a 30-in. belt, 285-ft. centers, which discharges through a 48-in. by 22-ft. trommel screen.

Unique Method of Feeding Material to Conveyor

At times the hopper contains both dry and wet material. The wet material does not mix at all with the dry, and is very fluid and soupy which made feeding a difficult job. At first surges flooded the entire lower end of the conveyor. A plunger arrangement, consisting of a horizontal,

General view of plant. To the left are trucking bins, center is loading tipple and on right is screening plant

Left: Two of three crushers which take feed from bins and discharge to a common belt. Right: The crushers as seen from above and the right. In background are the truck bins

tight-fitting plate to cover the bottom opening solved the problem. The plate is raised or lowered from above by moving a lever up or down that turns a shaft upon which is wound the cable to the drop gate. A simple pulley system with a rope connected to the end of the lever makes it easy for a man to cut down the opening any desired amount to regulate the flow of soupy material.

The trommel screen is 22 ft. long with a 48-in. diameter inner barrel and a sand jacket to remove minus ¼-in. material. The first 8 ft. of the screen is blanked off and fitted with cascading blades to scrub and break up clay. Normal feed to the gravel sizing screens is the ¼- to 1½-in. gravel which is sized over two 4- x 10-ft., 3-deck vibrating screens in parallel. Bin storage (none for direct loading) in the screening plant is 1000 tons total in 100 ton bunkers. Stone to be crushed is put in three of them to be fed out into each of three crushers independent of the pit operation. The crushers, a 3-ft. Symons cone, a McCully No. 6 and a Cedar Rapids 15- x 24-in. jaw crusher, are mounted on the ground next to the bins from which they receive their feed through side bin gates. Crusher openings are different in each case, but all the smaller crushed sizes are produced through the cone crusher.

Two parallel 30-in. belt conveyors, each 220 ft. long, convey crushed stone, sand and gravel from the plant bins; the one to the railroad tipple from all the finished material bins, and the other conveying stone as crushed to another 30-in. belt which returns it to the screening plant. Crushed gravel is sized over two separate 4- x 10-ft. 3-deck screens. The only sand product is concrete sand made by fluming minus ¼-in. material from the trommel into an 11-ft. diameter vertical water wheel. The wheel consists of a series of buckets, with adjustable pitch, attached to the skeleton framework of the disc, and a simple settling tank. Dewatering is its principal function but the adjustable bucket pitch and an adjustable overflow gate are used to regulate classification. In addition there is a rake classifier.

The loading conveyor belt, in a tunnel between the two rows of plant bins, makes blending a simple operation, either of all-crushed, uncrushed or both crushed and uncrushed gravel. At the tipple, passage is over two 4- x 8-ft. single-deck washing screens. Dust and water is passed through 10-mesh by ½-in. slotted perforated cloth and wasted — the washed material either going into cars direct or transferring to a cross belt conveyor which takes it into separate truck-loading bins. Trucking bins hold 40 tons of each of six gradings. Connected electrical power totals 500 hp. W. E. Blanton is superintendent of this plant, and also of the company's Piedre plant.

Above: Railroad loading tipple is at far right and belt for returning crushed stone to screening belt, above left. Below: Crushed stone belt, left foreground, and finished material belt, to its right, going to rail tipple structure, shown in view above

Simple Launder Pockets To Grade Sand

Some practical suggestions for the recovery of fines so essential in meeting new specification requirements

TWO WELL-KNOWN AUTHORITIES on the subject of sand classification have offered comments on Mr. Shaw's series of articles with illustrations showing how the fine sizes may be recovered at a relatively small cost.

Comments of Raymond Dull, inventor and consulting engineer, follow:

Mr. Shaw's design for roughing pockets (ROCK PRODUCTS, May, 1940, pp. 49-50) is good as far as it goes, but I would add a few adjustments to make the pockets more serviceable. I would put in a sliding gate at the orifice with a screw adjustment to regulate the flow through the orifice as shown in Fig. 1. The

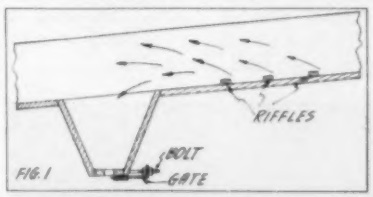


Fig. 1: Suggested improvement of Shaw's design for roughing pockets provides sliding gate at orifice

reason for this is that conditions change, and better control is desirable. I would also put riffles in front of each pocket. These riffles can be added to or taken from in order to cause the finer sands to rise. I would flatten the slope of the launder, after taking out coarse sand, to slow down the velocity when carrying only fine sand.

Another design of a launder is shown in Fig. 2. A flexible steel sheet is arranged to be sprung upward or downward by means of wing-nuts and bolts located on each side of the launder, but not running through it. As the coarse sand has a tendency to slide along the bottom, it may be taken out through the slot. Riffles should be used in this design also to cause the finer sands to rise and be carried along to the next opening.

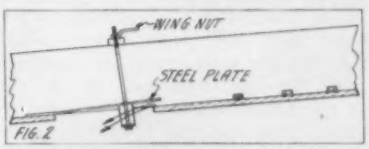


Fig. 2: Launder design has flexible steel sheet for removal of coarse sand

Dewatering Conveyors

We would recommend the use of dewatering conveyors as shown in Fig. 1 of the February, 1940, issue of ROCK PRODUCTS, p. 87, for dewatering the discharge from each pocket, as they discharge very dry, and the agitation of the water is very slight.

There are two accepted ways of grading sand to meet certain specifications. One of them is to separate the sand into three or more ranges of sizes, accomplished by flowing from one classifier to another of the type shown in Figs. 3 and 4, of the previously referred to article, then recombining on a belt by feeding required amounts of each size to meet the specification. Usually insufficient handling by the conveyor will require a remixing of some kind.

The other method is to use a classifier tank as shown in Fig. 3 having a series of V bottoms, progressively wider and deeper, to slow down the velocity of flow continuously in order to deposit sizes from coarse to fine.

The drawing shows quite a number of small spigots with hose attached to each. Below the classifier tank is shown three dewatering conveyors. If sand for a certain specification is to be delivered to the center conveyor, the required number of hose from each pocket are moved to discharge into the conveyor. The remaining spigots discharge either into the other conveyors or are flumed

Comments on Shaw's Sand Classification Articles

A number of interesting letters have been received commenting on Shaw's series of articles on Sand Classification in which suggestions have been made for improvements. To provide an opportunity to publish these valuable contributions to the subject and the illustrations accompanying them, the series of articles will be interrupted this month for inclusion of the comments which appear, herewith. The next installment of Mr. Shaw's series will be in the July issue of ROCK PRODUCTS. — The Editor.

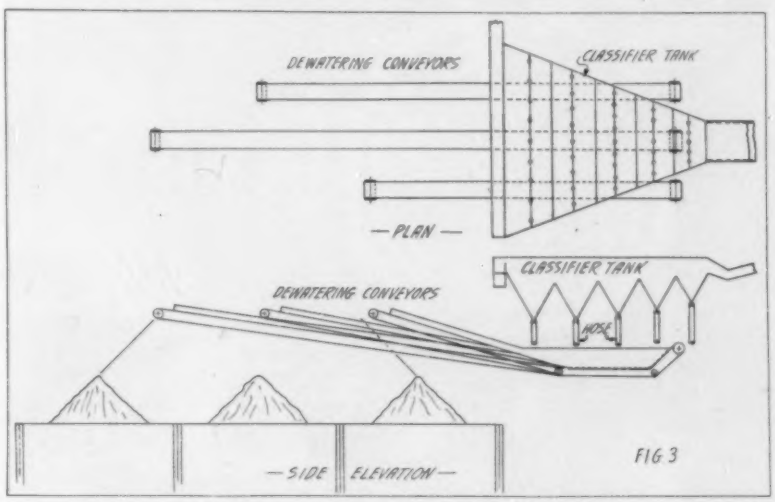


Fig. 3: Classifier tank having a series of V-bottoms to continuously slow down the velocity of flow to deposit sizes from coarse to fine

away as waste. Naturally if certain deficient sizes can be added without too much expense, this would be the thing to do. It sometimes happens that by changing the location of excavation in the pit, a correction of the product can be made to suit the shipping requirements for a particular contract. It should be evident that an experienced engineer should design the classifier tank to suit the conditions.

* * *

The following has been prepared by A. L. Munro, chief engineer, Smith Engineering Works, Milwaukee, Wis.

I have read over recent installments of Mr. Shaw's articles with interest. His remarks correspond very closely with our experience. We have made some similar installations using three sand tanks in series to roughly separate the sand into three separate sizes. We then combined part or all of the material from one or more of these tanks and ran it into a screw washer or sand drag. This results in thoroughly mixing the material before it is put into the bin. As any amount can be bypassed or wasted from each of the tanks, a fairly accurate separation can be made.

There is a dredging plant north of Milwaukee in which the producer uses a home-made device that gives somewhat similar results although the method of handling the sand after it is separated does not result in any great accuracy.

The material is excavated by an 8-in. pump so that this producer has quite a large volume of water. The sand and water are carried away from the plant through a fairly long narrow flume. This flume has shallow baffles at regular intervals with small hoppers attached to the bottom of the flume just back of the baffles. In all, there are about ten of these little hoppers, each one having a molasses spigot tapped into the bottom. These spigots are held closed by a counterweight but there is a wire attached to each one of them that runs over a series of pulleys to bring it to a central point where it is attached to an operating lever. As these spigots are manually controlled, an operator is required at all times to keep them discharging properly. This operator stands or sits on a bench under a shelter with the ten levers in front of him and at such a point that he can watch the operation of all the spigots. These are opened up and left open until such a time that he notices water flushing through any one of them. He then closes the spigot for a short time, after which they can be opened again. There is quite a large hopper arranged at the lower end of the flume for catching the real fine sand.

This method gives a very nicely graded sand ranging from quite coarse at the upper end to very fine at the lower end, but the only method of controlling the product afterwards is by using a stiff-legged derrick and a clamshell which picks up the material from any one of the deposits and drops it into a steel hopper. When the demand calls for fine sand, it is taken from the lower end of the deposit while concrete sand is taken from the upper end. But if there is any complaint of not having enough fines in the concrete sand, some of the finer sand is mixed with it. This method of course is rather crude but it seems to work.

Bulk Cement Carriers

BULK cement containers and truck carriers of different designs are being developed to facilitate the handling of portland cement direct from the mills to the point of usage. Special facilities, as shown in the photograph, were arranged recently by the Ford Motor Co. cement mill at Dearborn, Mich., to quickly load large capacity bulk cement trailers of a new design. These trains are made up of a semi-trailer and a 4-wheel trailer and are usually pulled by a large Diesel tractor truck

Each trailer body is constructed of sheet steel with steel channels reinforcing the sides and ends. Three worms driven externally by a gasoline engine mounted externally at the front end extend the length of the body to move the cement to the discharging chute at the rear. Rate of discharge of the cement is controllable, since the worms may be operated separately or together. Three trains, carrying 160 bbl. per trip, shuttled back and forth from the mill to a paving job recently completed west of Ann Arbor, Mich. This project serves to illustrate to what extent bulk handling equipment may be developed in States where load restrictions will permit. George F. Alger Co., Detroit trucking contractor, developed the trailers and Frank J. Knight, road-building contractor also of Detroit installed a new type automatic hopper to receive the truck loads of cement.

Loading large capacity bulk cement trailer. This unit, consisting of a large semi-trailer and two 4-wheel trailers, carries 160 bbl. of cement per trip

Plant Testing Pays Dividends

ARTICLE FIFTEEN

On sizing, testing and specifying aggregates gives many reasons for maintaining a plant laboratory

By ELWOOD T. NETTLETON*

IN THE FOURTH of this series of articles (ROCK PRODUCTS, July, 1939, pp. 32-33) I discussed the necessary equipment and its cost, for a simple plant laboratory, operated part time. The reader is referred to that article so that he will understand that the "testing laboratory" we mention in what follows is really a very modest affair.

Financial Saving to Company

The actual value to the company of the installation and operation of a testing laboratory falls into three classes; direct savings, indirect savings, and goodwill. The direct savings to date, in the company I was with, through producer's knowledge of the gradation of his product, have taken the form of less cash adjustments to customers in the form of allowances, damages, and extra costs, due the customer where crushed stone was either improperly graded, dusty, or dirty. Since the installation of a testing machine, the loss on direct allowances dropped from $2,445.15 in 1935 to $242.81 in 1936, and to $151.15 in 1937. Previous to 1935, direct allowances were running annually from $2,500 up, with the emphasis on the up.

The actual estimated cash saving may be figured as follows:

1936		
$2,445.15 minus $242.81 =		$2,202.34
Cost of laboratory and equipment	$976.85	
Cost of operation 1936	423.95	
=		1,400.80
Saving 1936		$ 801.54
1937		
$2,445.15 minus $151.15 =		$2,294.00
Cost of operation 1937	$311.85	311.85
Saving 1937		$1,982.15

Thus, it may be seen that in a period of two years, the company had not only written off the cost of the equipment and laboratory, but had saved in addition $2,783.69.

The indirect savings are made in the following channels: prepaid transportation charges on unsatisfactory material, time and expenses of the adjuster for the producer, telephone calls, rebilling, office corrections, and loss of material involved. Experience has shown the indirect costs to be far in excess of the direct costs.

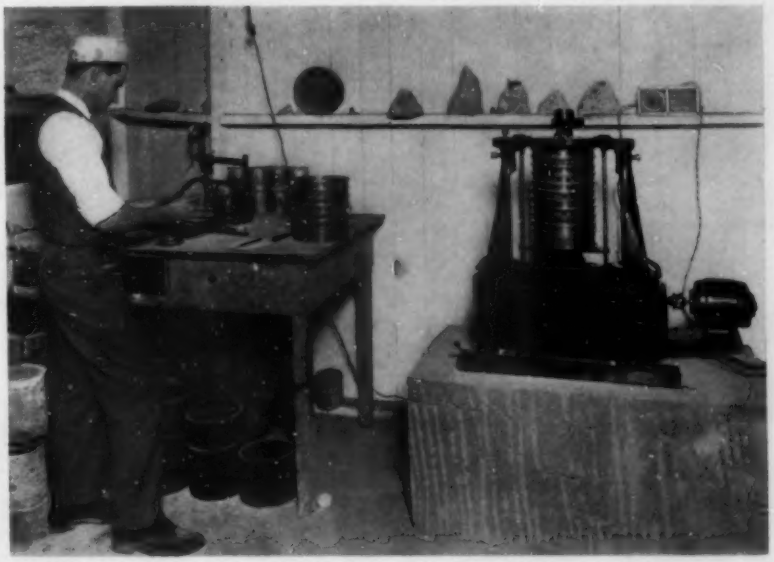
Besides the direct and indirect financial loss there is bound to be loss of goodwill between the contractor or engineer and the producer. Possibly to the treasurer of the producer's company this would appear slight; to the salesmen or sales manager it appears large. Just how much this loss of goodwill would influence a contractor in future purchases is problematical. Where there is a difference in price between competitors, it may not be influential, but it may be the deciding factor where prices are equal. At any rate, it is always a sales resistance argument that few contractors overlook.

Handling of Complaints

Tests provide a further saving to the company by helping to eliminate complaints. Formerly, rather than antagonize their customers, producers were inclined to allow claims which the producers were unable definitely to prove.

A typical case might be cited:

A notice from a job was received by a producer stating that base stone for a penetration macadam road was rejected by the contractor. Specifications called for 2½ to 1 in. uniformly graded stone. It was reported that too much fine stone in the mixture prevented the contractor from adding the proper filling for sand binding and rolling the job. The producer who was sure of his product, because tests had been made, requested the state construction and testing engineer to go to the job with him. They found that the stone was correctly graded and sized, but that the contractor was using sand containing gravel up to 1 in. in size to bind the



Motor-operated standard testing sieves used to make a size analysis, to the right, and to the left, laboratory attendant weighing material retained on screens

* General Superintendent, L. Suzio Construction Co., L. Suzio Trap Rock Co., The Suzio Trap Rock Co., and the York Hill Trap Rock Quarry Co., Meriden, Conn.

Corner of aggregates testing laboratory showing to the left a "Ty-Lab" tester for checking stone gradation

⅛- to ¼-in. voids in the stone after it was rolled. Naturally, this did not work well. Consequently, the state engineer insisted that the contractor screen the sand.

The cost to the contractor was several hundred dollars for screening the sand. The cost to the producer was one day's demurrage on fourteen railroad cars. This contractor was in the habit of receiving allowances on the job from material men, and he evidently expected to do so in this case.

Purchase of Screens

Another virgin field where money may be saved is in the purchase of screens and screen media. Very little research has been carried on by producers as to a study of the efficiency, life, and economic operating costs of various individual screens and screening surfaces. This research may now be made at each plant with the aid of a mechanical stone tester.

Miscellaneous Advantages

Cases often arise where special problems warrant the engineer's requiring special sizes or gradation of stone. In the past it has always been problematical whether any certain producer can economically meet such a specification or not. Usually the producer has succumbed to the salesmen's pressure and accepted the order. The trial and error usually proves unsuccessful and creates much ill-will. Perhaps, before the job is completed, a solution may be found; perhaps one will never be found.

With the knowledge of various plant averages as to gradation of sizes of stone, the probable limits of deviation from the average, and the approximation of change which any slight variation of top or bottom limits might make in gradation or production percentages, theoretical calculations may be made with a fair degree of accuracy for determining whether specifications can be met, and what changes may be necessary to produce certain desired results.

As a result of all the findings shown as to the advantages of a company testing laboratory, it is recommended that all producers operating two or more quarries, and even those producers operating a single quarry whose output exceeds 100,000 tons annually, should immediately install a small testing laboratory equipped with a mechanical testing machine for the gradation of stone. They would then be in a position to run tests on their product, to determine their screen efficiencies, and carry on research.

Those companies of smaller tonnage might do well to have periodic tests from time to time by commercial testing laboratories. When the number of individual test samples for any one year exceeds twenty-five, it would be well to consider the purchase of a mechanical testing machine.

Further Research, Tests, Studies

Recommendations for further research, tests, studies, and investigational work are:

In the Laboratory

(1) Rechecking of normal grading of various sizes at all plants.

(2) Efficiency of various types of screens and screen material.

(3) Elongations and flats as affected by crusher settings and reduction ratio.

At the Quarries

(1) Cost, life and tonnage records over various screens.

(2) Time studies and records of uniformity of flow into and through screens.

(3) Dust collection.

(4) Washing.

In the Industry

(1) Recommending and advising other producers to carry out testing and investigational work.

(2) Pooling of this information between members or through trade associations.

(3) With such information as a basis, joint conferences with consumers should be held.

(4) Actual selling to consumers the idea of the advantages to the consumer of economical, simplified, and more standardized specifications.

Speed Up Quarry Haulage

(Continued from page 26)

ment is flexible in that it can be loaded out by truck, by railroad cars or moved by crane, and it may be reclaimed with this equipment. One storage area is 2000 ft. long, and the other is 500 ft. long. There is a railroad track running through the center of each storage area with a truck driveway on each side of the stockpiles. As all cars have to be delivered about two miles to the Rock Island railroad, a 45-ton Plymouth gas-electric locomotive is used for switching purposes. There is an empty car track capacity for 75 railroad freight cars.

The plant is equipped with thirty 2-cu. yd. capacity steel flat pans for handling rip-rap stone which is loaded into truck or railroad car with a crane.

Asphalt Plant

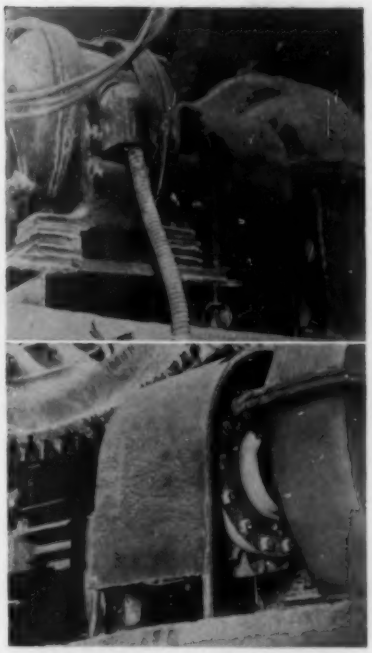
Asphalt road mixes are produced in a separate plant building alongside the railroad tracks leading from crushed stone plant to the steam railroad right-of-way. Material is trucked to the plant and dumped into a hopper from which it is elevated into the plant by bucket elevator, 75-ft. centers, and discharged into four bins, each of 40 tons capacity. Aggregates are drawn out of the bins by weight into a batching box, and then chuted into a pug mill in 1500-lb. batches where it is intimately mixed in the desired amount with cut-back asphalt. From the pug mill, the road mix is chuted directly into railroad cars. Asphalt is stored in two large steel tanks, each of which has a capacity of 10,000 gal. It is heated by steam to 120 deg., and is pumped into the plant to the pug mill as needed.

An interesting building is the machine shop. This structure, which has framing members composed of steel pipe of various sizes, all welded together, was built by company forces with materials frequently used in operation of the plant. The building is 30- x 80-ft. in plan, and about 25 ft. high in the center. Doors have sufficient clearance to admit the 50-ton steam locomotive crane, the 45-ton gas-electric loccmotive, and also the 50-B-Bucyrus electric shovel by lowering the boom. A standard gauge railroad track runs through the center of the building which is a convenience in receiving supplies and in making repairs on the locomotive equipment.

Officers of the company include W. F. Wise, president, and W. L. Holland, vice-president, secretary-treasurer. A. E. Crum is superintendent of the Chico plant.

Convert Rock Dryers From Gas to Coal

Develop special rubber ring coupling to take up shock and vibration on all drives



Two views showing application of rubber coupling on drives. Note two rubber rings on motor base

CONVERTING EQUIPMENT fired by natural gas to coal firing in Oklahoma where natural gas is so plentiful may at first occasion some surprise, but the Dewey Portland Cement Co. plant at Dewey, Okla., did make the change for very sound reasons.

For a number of years, the three rock dryers in this mill had been fired by natural gas while the five kilns were fired by pulverized coal from a centralized coal grinding department. The coal pulverizing department maintained for the kilns had more than ample capacity to produce fuel for the kilns and the rock dryers, and a cost study revealed that the expense of a separate natural gas firing system for the rock dryers was not justified.

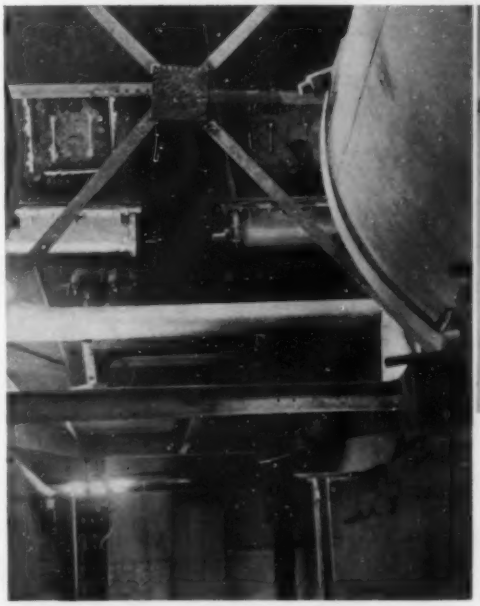
It was then decided to change over the natural gas fired rock dryers so that they could be fired with pulverized coal, and to make the necessary changes in the coal pulverizing department to supply the fuel. The coal pulverizing department has a battery of three Raymond mills, each of which has a capacity of 5 tons per hr. When the rock dryer conversion to coal firing was made, pulverized coal was pumped by a Fuller-Kinyon system to the dryers through the same 5-in. pipe line which feeds the kiln storage tanks. The only change required was the construction of a wye connection with a two-way (wye) valve which diverts the coal stream to a branch pipe line for filling the coal storage tanks located immediately in front of the rock storage silos.

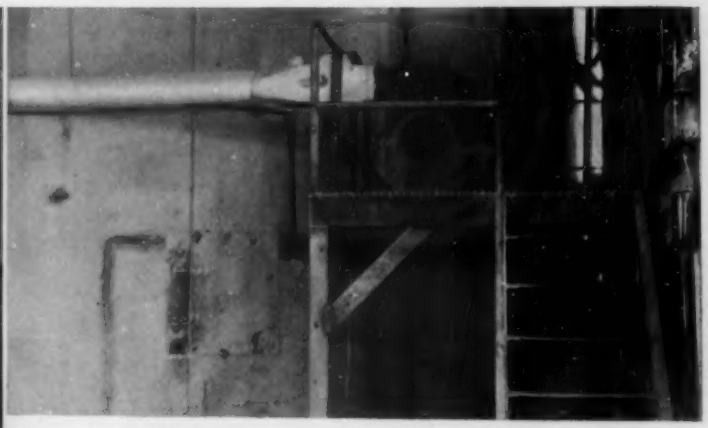
Welded Coal Tanks of Unusual Shape

The coal storage tanks for the dryers were welded in the plant, and are trapezoid in shape to make them fit into the limited space in front of and between the rock storage silos.

One of the coal storage tanks, having a capacity of 2324 cu. ft., has sloping bottom hoppers with steel slide gates which are opened completely when the dryers are in operation. Below each of the two hoppers is a 6-in. screw feeder, driven by a Reeves geared motor with a gear ratio of 21.2 to 1. It supplies a regulated rate of feed of coal to each of two rock dryers through a 6-in. diameter pipe section joined to an 8-in. diameter air supply line. The 6-in. pipe extends 3 ft. in the end of the dryer as a nozzle. One of these dryers is used to handle stone screenings.

For the third rock dryer, it was necessary to construct a separate fuel





Above: Blower fan and pipe leading to dryers, shown to right

Left: Looking up between two rock dryers, showing two fuel hoppers leading from one tank and screw feeders to regulate amount of coal fed to blower pipe

Looking at battery of three rock dryers and their respective drives

storage tank of 1162 cu. ft. capacity because of space limitations. This also is of trapezoid shape and pays out coal to a screw feeder driven by a Reeves geared motor.

Rubber Couplings For Drives

The screw feeders are driven at 10 r.p.m. They are ball bearing equipped and are fitted with a special rubber ring coupling, developed and patented by one of the company officials, to cushion the drives against shock and act as a safeguard in the event of overloading. This type of rubber coupling is used on all drives whereever possible, and may be seen in the accompanying illustrations. It consists essentially of a series of rubber rings through which steel bolts or lugs are passed from facing steel discs; one from each disc or two to a rubber ring. The steel lugs transmit the thrust to the rubber rings, which take up any shock and vibration.

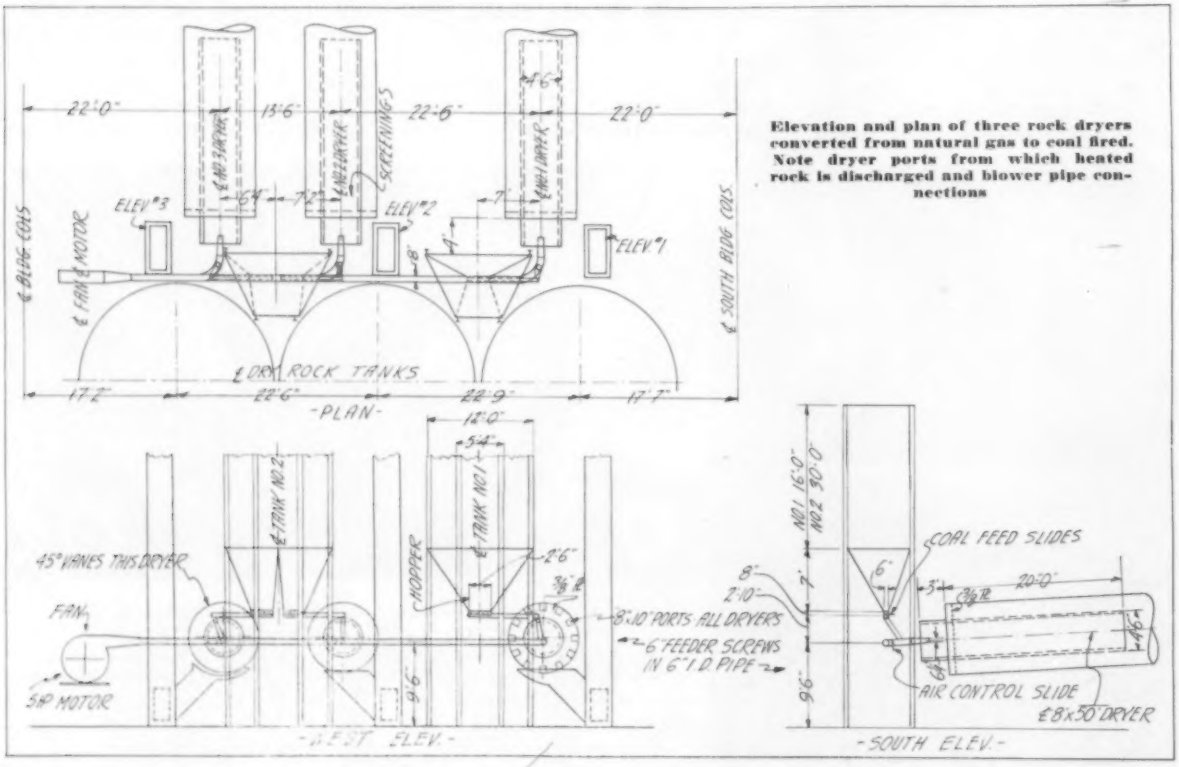
Primary air for combustion, which also injects the pulverized coal into the dryers, is supplied through a single 8-in. diameter steel pipe, extending horizontally from a fan and connecting to all three screw feeder pipe connections leading to the nozzles of the rock dryers. The fan (Northern Blower Co.) which is driven by a 5-hp. Westinghouse induction motor, supplies 2300 c.f.m. at 1740 r.p.m., or from 20 to 25 percent of the air required for complete combustion.

Each of the three rock dryers has a capacity of 75 tons per hr. and is operated at a temperature of 250 deg. F. They are each 8 ft. in diameter and 50 ft. long, and are driven by a 40-hp. Allis-Chalmers induction motor through a Falk gear reducer with a gear ratio of 54.18 to 1.

Originally the dryers were made by the United Iron Works, Pittsburg, Kans., but the firing ends had to be entirely rebuilt. In changing fuel from natural gas to coal, a sheet steel hood, through which the gas pipes had been run, was taken off. In its place, a firing tube of steel, 4 ft. 6 in. in diameter and extending 20-ft inside the dryer and 3 ft. out at the firing end, was then centered and anchored securely within the dryer by rods fastened to the outer shell of the dryer in such manner that unequal stresses will not cause any damage. This tube is lined with 4-in. refractory brick.

Rectangular ports discharge dried stone, and also admit air outside of combustion tube to cool stone and carry off moisture.

Natural gas will continue to be available as a fuel to heat the dryers before the pulverized coal system is turned on, provision being made in the firing end for a gas nozzle.



Elevation and plan of three rock dryers converted from natural gas to coal fired. Note dryer ports from which heated rock is discharged and blower pipe connections

Surge Storage Pile Reduces Shutdowns

Loading out station provides four batching bins to serve ready-mixed concrete trucks and three bulk loading bins

SIMPLE IN DESIGN but efficient in operation is the way one may describe the new sand and gravel plant of the Wolf River Sand and Gravel Co., located near Memphis, Tenn., and placed in operation in 1939. The Kern system provides much larger live storage capacity than the old plant, and a rapid method of reclaiming six finished sizes for loading into cars, trucks or bins at the loading out station for retail sales and ready mixed concrete batching.

It is an alluvial deposit with a 12 ft. overburden covering a 50 ft. deposit of usable material. Both overburden and sand and gravel are removed with the same dredge. The new 28- x 52-ft. dredge boat, which replaces an old wooden unit, has a steel sheathed deck house supported by girders resting on pontoons made of welded steel tank car sections. The A-frame is supported by large steel cylinder pontoons extending out about 70 ft. Equipment includes a 65 ft. Pettibone-Mulliken chain ladder and Diamond cutter head, a 12-in. Pettibone-Mulliken pump driven by a 400-hp., 440-volt Westinghouse motor, and an American hoist with a 10,000 lb. line pull. The pump has a capacity of 130 tons an hour. The dredge is maneuvered by two shore line cables driven from the boat.

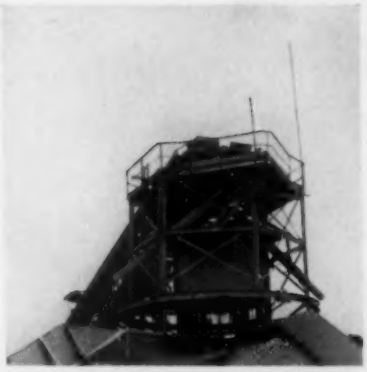
Material pumped by the dredge goes to a desander which removes an excess of certain sand sizes. The desander is a strongly built timber structure with a breaker plate to break the force of the falling material which overflows to an inclined 8- x 15-ft. stationary screen with ¼ in. by 5 in. slotted openings. About one-half of the throughs go to a screen with ⅛ in. square openings, the rest going to a 36-in. Link-Belt sand drag, 25-ft. centers. Excess sand is flumed to waste in the lake. Dewatered sand, together with the gravel, goes to a 20-in. belt conveyor, 250-ft. centers, which elevates it to the Kern surge storage tower.

Remove Excess Sand

Gravel from the top of the desander gravity screen falls to a short conveyor at the bottom which carries the material to two 25-ft. McLanahan-Stone log washers. While the material is thoroughly scrubbed, sprays of water are forced against it.

Hydraulic water for the sprays is furnished from a floating pump house.

As previously mentioned both gravel and sand meet on a 20-in. inclined belt conveyor, 250-ft. centers, and are elevated to the Kern surge storage tower which has a deflecting turret that distributes the material on all sides. The purpose of this surge storage of approximately 750 tons is to supply a sufficient quantity of material from the dredge operations, which are almost continuous, so that the screening and washing plant may operate on an 8-hr. day.



Main storage tower controlling the distribution of 76,000 tons divided into four gravel and two sand sizes

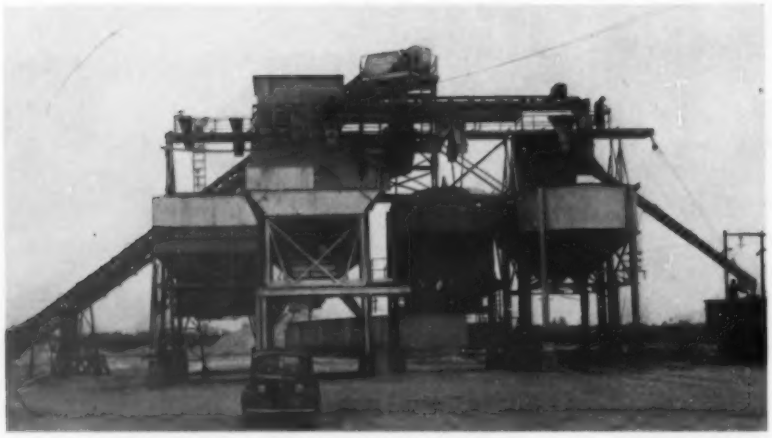
When the screening and washing plant starts in the morning, material is reclaimed from the surge storage pile through a gate at the bottom of the tower, feeding the conveyor, 170-ft. centers, which operates in a concrete tunnel and then inclines upward to the screening plant.

At the top of the screening and washing plant is a 3½- x 12-ft., Symons triple deck, vibrating screen. The first deck has a 1¼-in. screen cloth, the second ⅜-in., and the bottom, 3/16-in. Sand passing this screen goes to two 18-ft. Eagle double-screw dewaterers placed in tandem to give a capacity of 50 tons an hour of a comparatively dry product. This is elevated on a 20-in. conveyor belt, 208-ft. centers, to a shuttle conveyor below which distributes the material to either side in two of the segments of the main storage area.

Oversize gravel from the triple-deck Symons screen goes to an 18-in. Traylor gyratory crusher. The crusher product is chuted to the same conveyor belt to which smaller gravel sizes from the screen are chuted. This 20-in. conveyor, 252-ft. centers, parallels the sand conveyor, but extends up to the top of the main Kern storage tower where it feeds a 3½- x 14-ft., 2½-deck Symons vibrating sizing screen. This screen produces ⅜-in. to 1¼., 1¼- to 2-in., +¼ —⅜-in., and +⅛ —¼-in., each size being chuted to a separate storage segment. Two segments hold highway concrete sand. Total storage is 76,000 tons of material.

As material is reclaimed from the main Kern storage, a 1½-cu. yd. scraper bucket, operated by a cable extending from a ring on the tower through sheaves on the boom and thence to the hoist of a Moore Speed

New dredge boat with a pumping capacity of 130 tons per hour is equipped with a 65-ft. chain ladder, cutter head, and 12-in. pump. Note dredge pipe line, floating pump house, surge storage tower, and screening plant in the background



Loading out bins with batching equipment for ready mixed concrete and retail deliveries. Shuttle conveyor on top permits distribution of various sizes in chutes leading to bins and to long spout for carload shipments

crane, draws the material up into the storage segment. When any particular size is wanted, the operator pulls a lever actuating a rod that opens a gate at the bottom of the tower, releasing the material to the conveyor which operates in a tunnel. This 24 in. belt conveyor, 365-ft. centers, emerges from the tunnel and inclines upward to the loading out bins.

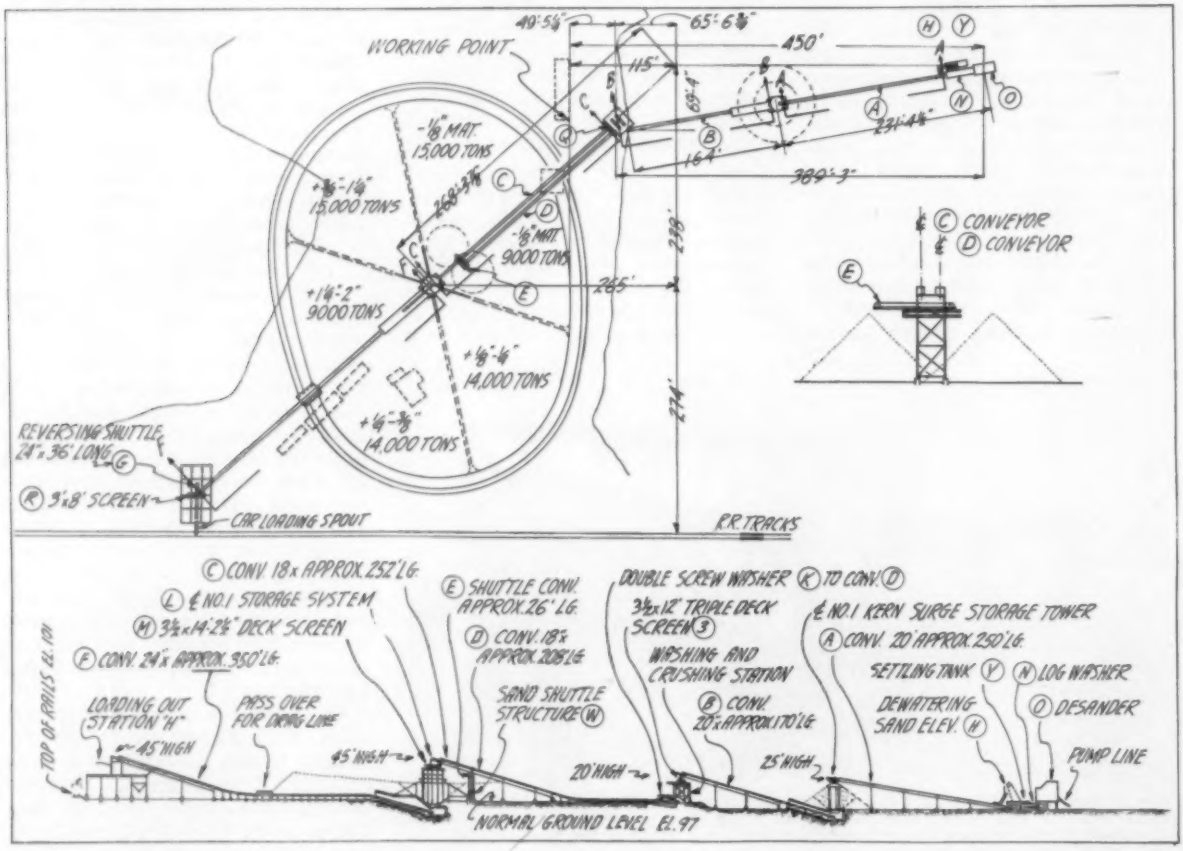
At the loading-out station there are four steel batch bins, two of which have Butler and two Blaw-Knox weighing equipment. These bins have the following capacities; one 70-ton, two 50-ton, and one 40-ton. In addition to the batch bins, there are three 70-ton bins for loading out in bulk to trucks. Railroad cars are loaded with a special hinged chute, shown in the illustration, which receives material from a short shuttle conveyor on top of the plant. This conveyor also serves to place material into batch bins by means of chutes.

A substantial tonnage of business is done with ready-mixed concrete companies whose trucks are accurately batched with aggregates and cement. A Neptune water meter is also available to measure out the proper amount of water. In this connection, the Marquette Cement Manufacturing Co., Chicago, owners of the Wolf River Sand and Gravel Co., have a large storage warehouse for sacked cement.

To supply fine sand, medium plaster sand, and a brick sand, the company is now rebuilding an auxiliary sand plant. A small dredge with a 6-in. Morris pump driven by a 50-hp. General Electric motor will pump material to the plant.

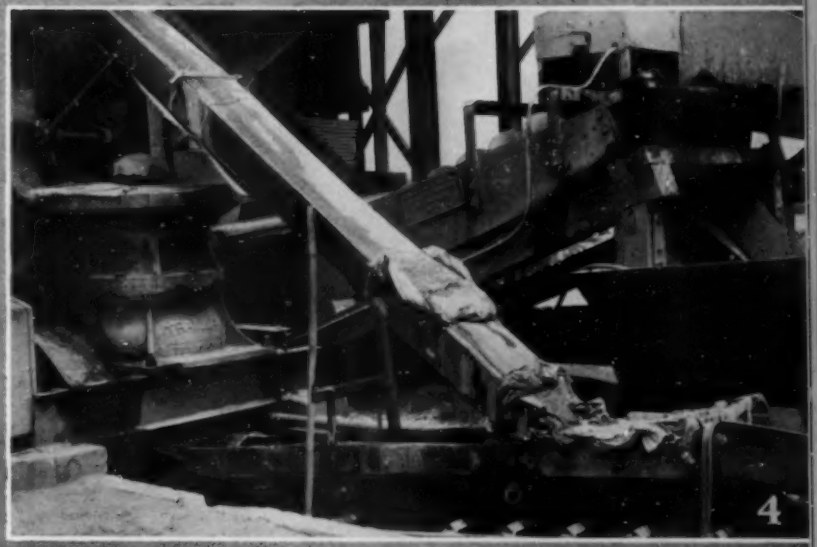
Other equipment includes an Allis-Chalmers tractor equipped with a bulldozer for use in cleaning up the yard and stockpiles. The plant also has a 1-cu. yd. American Hoist and Derrick shovel to assist in stockpiling. All conveyor structures are of steel supported on concrete piers, and were furnished by the Fred T. Kern Co. Conveyor idlers are products of the Dodge Manufacturing Co.

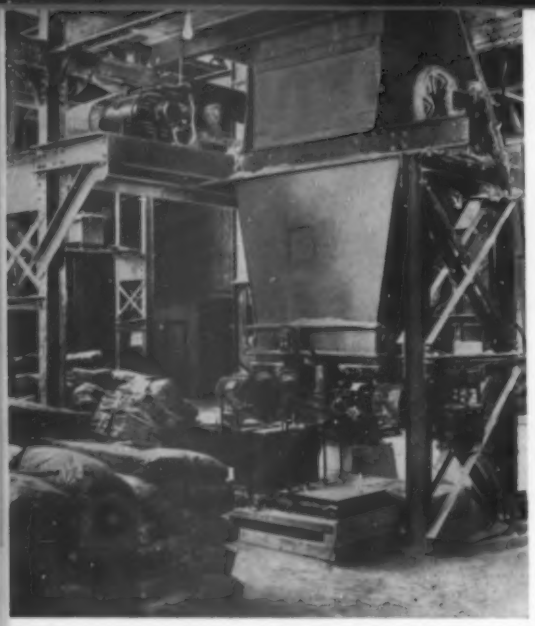
Layout of main storage screening plant, and surge storage areas, and elevation of various units from desander to loading out station



WOLF RIVER VIEWS

Fig. 1: Intermediate surge storage tower with reclaiming tunnel conveyor. Fig. 2: Conveyor leading to top of loading out station and batching bins. Fig. 3: De-sander, showing gravity screen with short conveyor at bottom to take over-size gravel. Fig. 4: Crusher at the left, with troughs feeding gravel conveyor and chute from screen above to same conveyor. Two double-screw sand de-waterers in tandem, to the right. Fig. 5: Second dewatering screw feeding sand conveyor with gravel conveyor to the right. Fig. 6: Screening plant with triple-deck vibrating screen above and sand dewaterers below





Plaster mixing machine which handles 1000 lb. batches of plaster to which set control ingredients are added

Gypsum Operations In Great Britain

Automatic instrumentation to control calcination, the use of electrical precipitation and mixing methods for plaster board highlight one of England's most modern plants

GYPSUM PLASTER and wallboard are manufactured by the British Plaster Board Co., Ltd., at a modern, large-capacity plant at Erith in Kent, England. Location of the plant is on the Thames River where there are facilities for the economical handling of gypsum rock transported by steamers from the company's deposit in Nova Scotia.

Crushing Operations

A quarry face 60 ft. in height is worked in Canada, using steam shovels and lorries to load and deliver the rock to a crushing plant which breaks it down to 4-in. top size. This product is conveyed to a storage shed and reclaimed by belt conveyor into the hold of the steamer at the rate of 500 tons per hour. The average steamer load is 6000 to 7000 tons.

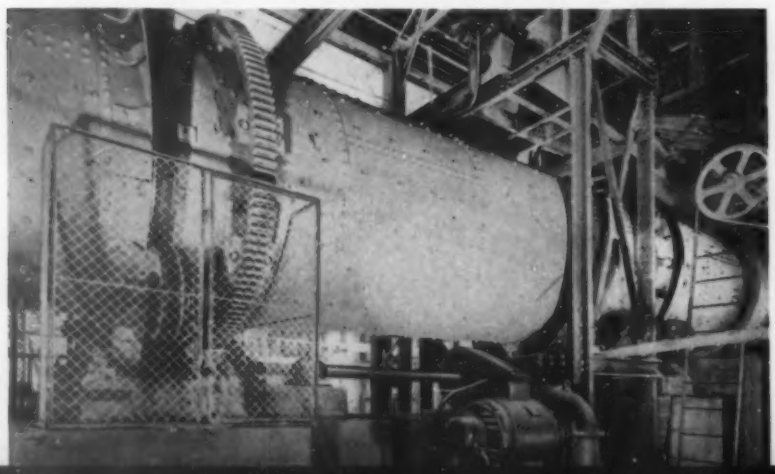
Upon arrival at Erith, the steamer is unloaded by two five-ton electric cranes operating 3-ton grab-buckets, which dump into hoppers on the pier. The cranes and hoppers are self-propelled for accurate spotting alongside the ship hold. About 3½ days are required to unload a steamer.

Each hopper has a belt-driven feeder below, which pays out rock to a belt conveyor. The two belts deliver stone to a 24-in. conveyor belt, 745-ft. centers, which carries it to a large stockpile conveniently located with respect to the crushing operations. The stockpile is trimmed and the rock reclaimed into a large hopper under the stockpile by a slackline cableway and scraper bucket having a 2-ton capacity. A steel apron feeder controls the rate of feed out from the hopper into a single-toothed Pennsylvania roll crusher with side plate, which breaks down the stone from the 4-in. size to pass a 1½-in. ring at the rate of 50 tons per hour. The crusher discharge is elevated to an overhead gantry and conveyed to a storage silo inside the mill.

Drying and Dust Collection

To remove surface moisture the crushed rock is taken from storage and is put through a coke-fired 5- x 36-ft. Ruggles-Coles rotary dryer by an automatically controlled apron feeder. The warm, dust-laden air as it leaves the head of the dryer is passed direct to a Lodge-Cottrell electrical dust precipitator. Operating under a charge of 50,000 volts, direct current, the dust particles are collected on the series of collecting tubes. Dust is removed automatically at intervals to the bins containing the finely ground material, and the cleaned air escapes to the atmosphere.

Gypsum dryer which is connected to an electrical precipitator dust collector



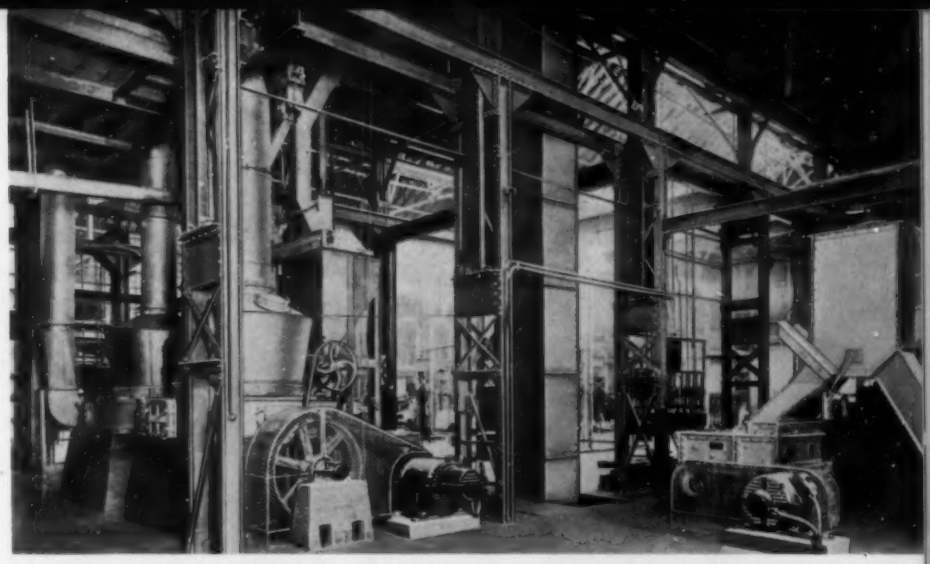
Dried crushed rock as discharged from the dryer passes directly into a Pennsylvania swing hammer mill. The manganese steel hammers revolve at 1000 r.p.m. and break the material down to minus ⅜-in. at the rate of 30 tons per hour, with a power consumption of 1.1 hp. per ton.

Minus 100-mesh is then separated out by elevating and conveying the hammer mill product to a mechanical air separator, the fines being conveyed to the pulverized stone bins and the rejects are pulverized by passage through two Raymond 5-roll mills. The mill product is carried upward to two cyclones where a separation is made at 100-mesh, the fines being conveyed to the storage bins. The grinding mills are in closed circuit with the cyclones, the cyclone rejects returning into the mills. If a superfine product is required, the fines from the air separator are put through a second air separator which ordinarily is adjusted to produce a grade of gypsum, 99 percent passing a 200-mesh sieve. Rejects also return to the mills in this circuit.

Ordinary practice is for the 100-mesh product in storage silos to be conveyed to two 10-ft. diameter, brick-lined steel calcining kettles. The kettles are coal fired. Calcination is done in 10 ton batches. The

*Consulting Chemist, Chemical Engineer, London, England.

By DR. JAMES WATSON*



Roll mills closed-circuited with overhead cyclones to produce 100-mesh product for calcination and the manufacture of board

gypsum contains an average of 20.9 percent water, which is carefully reduced to 5.7 percent of contained moisture by controlling the length of time of calcination.

The liberated water vapor is drawn through a suction pipe to a settling chamber, where part of the dust is collected. The remainder of the dust is removed by passage through the electrical precipitator.

Control Devices and Tests

A recording pyrometer enables close control of the calcining process. When a batch is finished, the plaster is dropped into a hot pit. A laboratory sample is taken at this point, and if the plaster is found to be faulty, it can be rejected or returned for re-processing.

From the hot pit, the plaster is elevated to two 100 ton storage silos, or it may be transferred to another bin for accelerating or retarding, or it may be sent direct to the main storage hopper for the manufacture of plaster board. A switchboard at the hot pit enables the attendant to control and quickly change the plaster movements to the various plant divisions.

In the production of plaster, the finished product in the plaster silos is first tested and then delivered into a 60 ton bin. From the bin, 1000 lb. batches automatically are fed out into a hopper and the necessary set control ingredients added. The hopper discharges into a paddle mixer, which in turn empties into a hopper over the bagging machines. Every 1000 lb. batch is tested.

Manufacturing Plaster Board

An overhead conveyor carries plaster to another bin for the production of plaster board, automatically starting up when the hopper at the feed end of the soak belt is near empty and stopping automatically when the bin fills up. The soak belt is a 48-in. wide troughed rubber belt. Water from a circular spray is run on to the belt, which has a running speed set so that the plaster takes up the desired amount of water as it passes through the water.

Then sawdust and accelerator are added by means of a circular distributor and are stirred into the plaster mix by means of 16 sets of vertical shaft mixers turning in both clockwise and counter-clockwise directions. The mixture is then dropped on to a cross belt which feeds the board machine. The mix can be diverted to one side by movement of a lever, in case of stoppage of the machine.

Automatic Operation in Board Manufacture

Manilla paper from three to four feet wide is used in the manufacture of board. The paper, as it comes off the rolls to a rubber belt, passes through guides and a paper tension device. Grooves are cut near the edges of the bottom layer of paper so that automatically the edges are moved up vertically and bound to the plaster filling. After passing the scorers, the plaster mix is applied on the bottom paper.

The top paper comes down to meet it at the squeeze rolls. Edges are mechanically coated with a stiff paste, so that as the rolls squeeze the plaster mix out to the desired width and thickness, the top layer of paper meets it and is sealed down by the paste.

By means of an adjusting disc, the distance between the rolls can be regulated to one-thousandth of an inch to insure uniformity in thickness throughout.

As the plaster board is carried forward over the belt a distance of 320 ft., it passes under an ironing belt which smooths out any slight surface imperfections and keeps the paper in contact until the paste has set. As the end of the continuous sheet touches the electrical switch gear an electro-magnet operates a clutch and sets in operation the rotary cutting knife. By altering the position of the switches any required length of board can be cut off.

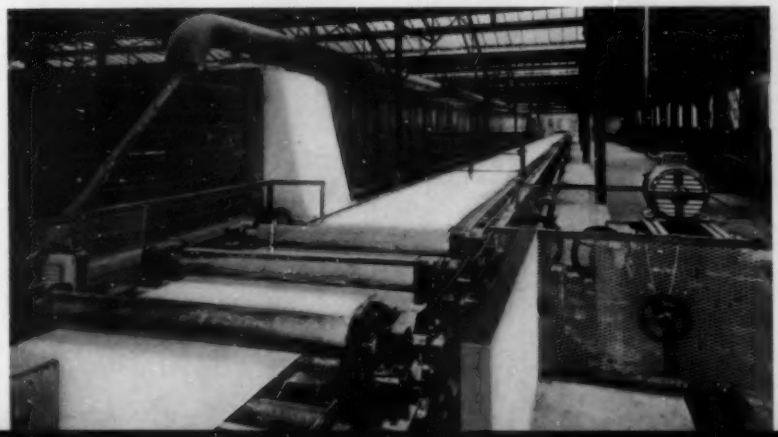
Hot Air Dryer

Every three lengths of board, as they are cut off, pass to a cross roller table which places them in front of the dryer. When electrical contact is made with another switch, the boards are conveyed into the dryer. The entire operation is automatic.

The dryer has six decks and is 300 ft. long. Board are dried as they pass through the machine by direct contact with heated air, driven through the dryer by two fans at the rate of 100,000 c.f.m. Temperature rises to 350 deg. F. at the outlet end of the dryer and about 1¼ hours are required for the cycle.

NOTE: Photographs furnished by The Fraser and Chalmers Engineering Works, General Electric Co. Ltd. of England.

Gypsum board conveyor line, showing hot air dryer to left. Cutting and transfer equipment in foreground



SAND AND GRAVEL WATCHMAN COLLECTS

Important U. S. Court Decision under Wages and Hours Act

THE District Court of the United States, Western District of Tennessee, recently decided a case under the Fair Labor Standards Act of 1938 (so-called wages and hours law) of considerable significance.

A night watchman at a sand and gravel plant, not in operation, was paid $2 per night to keep an eye on it. He lived next to the plant, and his employer believed he spent most of his time at home, as he undoubtedly could do, under the circumstances. He was discharged November 14, 1939.

He sued for back wages at the rate of 30c per hour, plus overtime, plus 100 percent penalty, plus attorney's fees. The court awarded all these amounting to $1,752.30 plus $250 for attorney's fees or a total of over $2,000. The total sales of sand and gravel from stock piles at the plant, during the period October 24, 1938 (effective date of the law) and November 14, 1939, for which the watchman was employed, amounted to only $12,522.65. Of this, but $884.36 worth moved in interstate commerce. However, the sand and gravel company was a subsidiary of a building supply company.

Conclusions of Law and Opinion

On the foregoing facts, the defendants contend that the Fair Labor Standards Act of 1938 (June 25, 1938, Ch. 676, Sec. 1; 52 Stat. 1060; Title 29, Secs. 201 to 219, incl., U. S. C. A.), is not applicable to this case, for the reason that (1) the plaintiff is not an employee "who is engaged in commerce or in the production of goods for commerce" within the meaning of the Act (Title 29, Sec. 206, 207, U. S. C. A.; Secs. 6 and 7 of Ch. 676, 3rd Session, 75th Congress, Public Act No. 718); and that (2) the plaintiff falls within the exemption provided for "any employee engaged in any retail or service establishment the greater part of whose selling or servicing is in intra-state commerce" (Title 29, Sec. 213 (a) (2) U. S. C. A.; Sec. 13 (a) (2) of Ch. 676, 3rd Session, 75th Congress, Public Act No. 718).

(1) The first question presented on the facts found is, therefore, was the plaintiff as an employee of the defendants engaged in the production of goods for interstate commerce? Counsel for defendants stresses the decision of Judge Miller in **Bagby v. Cleveland Wrecking Co.**, (W. D. Ky., June 23, 1939) 28 F. Supp. 271, in which a complaint under the Fair Labor Standards Act of 1938 was dismissed because the petition failed to state facts showing plaintiffs to have been engaged in "the stream of commerce as described in the Jones and Laughlin case."

In **National Labor Relations Board v. Jones & Laughlin Steel Corp.**, 301 U. S. 1, the Supreme Court upheld the constitutionality of the National Labor Relations Act of July 5, 1935, and speaking through the Chief Justice, said: (op. 37, 37) "Although activities may be intrastate in character when separately considered, if they have such a close and substantial relation to interstate commerce that their control is essential or appropriate to protect that commerce from burdens and obstructions, Congress cannot be denied the power to exercise that control. . . . The close and intimate effect which brings the subject within the reach of Federal power may be due to activities in relation to productive industry although the industry when separately viewed is local."

Indeed, even in **Schechter Poultry Corp. v. United States**, 295 U. S. 495, the Court said (op. 544): "We have held that in dealing with common carriers engaged in both interstate and intra-state commerce, the dominant authority of Congress necessarily embraces the right to control their intra-state operations in all matters having such a close and substantial relation to interstate traffic that the control is essential or appropriate to secure the freedom of that traffic from interference or unjust discrimination and to promote the efficiency of the interstate service."

The obvious purpose described by Congress in its declaration of policy, in Section 2 of the Fair Labor Standards Act of 1938, was to obviate "labor conditions detrimental to the maintenance of the minimum standard of living necessary for health, efficiency and general well being of workers." To accomplish the beneficent purposes of the Act, Congress manifestly intended and expected the courts to apply broadly and liberally the coverage of the Act to include those engaged in the production of goods, a portion of which were designed for interstate commerce. The legislative history of the Act supports this view, and it would be plainly defeating the clear intention of Congress should the courts limit the applicability of the Act, by restrictive judicial contraction of interstate commerce.

The argument is made in behalf of defendants that in cases where Courts of Appeal have upheld the applicability of the National Labor Relations Act, substantially larger percentages of the goods produced were intended for interstate commerce than is true in the case at bar. In support of this contention, defendants cite **Standard Lime & Stone Co. v. National Labor Relations Board** (CCA 4), 97 F. (2d.) 531, in which a manufacturer of lime-stone products sold 83 percent of his output in other states; **National Labor Relations Board v. Abell Co.** (CCA 4) 97 F. (2d) 951, 955, in which most of the raw materials used by a newspaper were shipped into the state and 16.85 percent of the paper's circulation was shipped outside the state; **National Labor Relations Board v. Carlisle Lumber Co.**, (CCA 9) 94 F. (2d) 138, in which 90 percent of the company's products were shipped out of the state; **National Labor Relations Board v. Wallace Mfg. Co.**, (CCA 4) 95 F. (2d) 818, in which a cotton textile manufacturing plant shipped 75 percent of its products directly out of the state; **National Labor Relations Board v. Eagle Mfg. Co.**, (CCA 4 1938) 99 F. (2d) 930, in which approximately 75 percent of materials used by a manufacturer were received from outside the state and approximately 95 percent of the finished products were shipped to points outside the state; and **National Labor Relations Board v. Fashion Piece Dye Works**, (CCA 3) 100 F. (2d) 304, in which 50 to 90 percent of goods processed were received from points outside the state by a company which transported in its own trucks to such points the goods received.

Counsel for defendants cites, also, two decisions of the Sixth Circuit Court of Appeals: **Clover Fork Coal Co. v. National Labor Relations Board**, 97 F (2d) 331, and **National Labor Relations Board v. Louisville Refining Co.**, 102 F. (2d) 678 (March 13, 1939), in first of which a coal mining company sold all of its production exclusively to a national coal sales company, f.o.b. the mine "the bulk" of the coal being transported to other states; and in the second of which the court stated, in holding that an oil refining company operating in Louisville, Ky., was engaged in interstate business: "A substantial part of the raw materials and the crude oil used originates outside of Kentucky, and much of the gasoline, kerosene and other finished products is distributed to Ohio, Indiana, and Kentucky."

The argument based on the foregoing authorities that the percentages between interstate and intrastate commerce in the distribution of goods produced is a material consideration is utterly demolished by two decisions of the Supreme Court of the U. S. In **Santa Cruz Fruit Packing Co. v. National Labor Relations Board**, 303 U. S. 453 (decided March 28, 1938) the Chief Justice said: (op 467) "There is thus no point in the instant case in a demand for the drawing of a mathematical line. . . . The critical words of the provision of the National Labor Relations Act in dealing with the described labor practices are 'affecting commerce', as defined. Section 2 (6). It is plain that the provision cannot be applied by a mere reference to percentages and the fact that petitioner's sales in interstate and foreign commerce amounted to 37 percent, and not to more than 50 percent, of its production cannot be deemed controlling."

In **National Labor Relations Board v. Fainblatt** 306 U. S. 601 (decided April 17, 1939), Mr. Justice Stone, speaking for the court, said: (op. 606, 607) "Nor do we think it important, as respondents seem to argue, that the volume of the commerce here involved, though substantial, was relatively small as compared with that in the cases arising under the National Labor Relations Act which have hitherto engaged our attention. The power of Congress to regulate interstate commerce is plenary and extends to all such commerce be it great or small. **Hanley v. Kansas City Southern Ry. Co.** supra, (187 U. S. 617, 619). The exercise of Congressional power under the Sherman Act, the Clayton Act, the Federal Trade Commission Act, or the National Motor Vehicle Theft Act, has never been thought to be constitutionally restricted because in any particular case the volume of commerce affected may be small. The amount of the commerce regulated is of special significance only to the extent that Congress may be taken to have excluded commerce of small volume from the operation of its regulatory measure by express provision or fair implication. . . . Given the other needful conditions, commerce may be affected in the same manner and to the same extent in proportion to its volume, whether it be great or small. Examining the Act in the light of its purpose and of the circumstances in which it must be applied we can perceive no basis for inferring any intention of Congress to make the operation of the Act depend on any particular volume of

commerce affected more than that to which courts would apply the maxim de minimis."

During the wage period involved in the controversy herein, the interstate sales of the Central Sand and Gravel Co. amounted to only 6½ percent of its total sales. "Central Sand and Gravel Co.", however, is only a trade name for the sand and gravel business of the real defendant, Fischer Lime & Cement Co., whose interstate business constitutes 15 to 20 percent of its total sales. The interstate commerce here involved is, therefore, plainly substantial. De minimis doctrine could not remotely apply to the facts found with respect to interstate commerce transactions in the instant case.

As shown in the record, numerous sales of material by the defendants to customers who transported the same to Mississippi and Arkansas in their own trucks would be embraced in interstate commerce. In **Santa Cruz Co. v. Labor Board**, supra, the Supreme Court said: (op. 463) "There is no question that petitioner was directly and largely engaged in interstate and foreign commerce. We have often decided that sales to purchasers in another state are not withdrawn from federal control because the goods are delivered f.o.b. at stated points within the state or origin for transportation. See **Savage v. Jones**, 225 U. S. 501, 520; **Texas & N. C. R. Co. v. Sabine Tram Co.**, 227 U. S. 111, 114, 122; **Pennsylvania R. Co. v. Clark Bros. Coal Mining Co.**, 238 U. S. 456, 465-468."

Two district court decisions are cited by defendants: **Foster v. National Biscuit Co.** (Feb. 20, 1940), 31 F. Supp. 553, and **Gates v. Graham Ice Cream Co.** March 1, 1940, 31 F. supp. 854. In both these cases, the plaintiffs were granted permission to amend their complaints, upon penalty of dismissal, to allege sufficient facts to place the cases within the purview of the Fair Labor Standards Act, the complaints as filed being deemed insufficient because they failed to show explicitly and distinctly that the plaintiffs were in their employment engaged in interstate commerce.

In the case at bar, no motion to dismiss on the pleadings was made, but the defendants' answer denied interstate commerce activities; and when the case came to trial evidence was adduced presenting fact issues which have been resolved by the foregoing findings of fact. Consequently, the district court decisions cited by defendants are not in point.

The contention is made that in his work as night-watchman, the plaintiff was not engaged in interstate commerce; and that, therefore, he is not entitled to the benefit of the provisions of the Fair Labor Standards Act as to wages and hours.

First looking to the Act itself, Section 3-j provides a broadly comprehensive definition of those engaged in the "production of goods for (interstate) commerce." It is expressly stated that "for the purposes of this Chapter an employee shall be deemed to have been engaged in the production of goods if such employee was employed in producing, manufacturing, mining, handling, transporting, or in any other manner working on such goods, or in any process or occupation necessary to the production thereof, in any state." U. S. C. A. Title 29, Sec. 203-j.

In interpretative bulletin No. 1 issued November, 1938, from the office of the General Counsel of the Wage and Hour Division of the U. S. Department of Labor, the benefits of the statute by the above-quoted section are said to extend to persons employed as watchmen.

Counsel for defendants emphasize three decisions denying inclusion of night-watchmen in the coverage of the Federal Employers' Liability Act. **New York Central R. R. Co. v. White**, 243 U. S. 188; **Wabash Ry. Co. v. Industrial Commission** 236 Ill. 194, 121 N. E. 369; **Califore v. Chicago St. P. M. & O. Ry. Co.** (Iowa; 1935) 263 N. W. 29. An examination of the facts of each of these cases plainly differentiates them from the case on trial. In the White case, the night-watchman was charged with the duty of guarding tools and materials intended to be used in the construction of a new station and new tracks upon the line of a railroad designed for use, when finished, in interstate commerce. The Court said: (op. 192) "Decedent's work bore no direct relation to interstate transportation, and had to do solely with construction work, which is clearly distinguishable as was pointed out in **Pedersen v. Delaware, Lackawana & Western R. R. Co.**, 229 U. S. 146, 152." The Supreme Court states that the test is, "Was the employee at the time of the injury engaged in interstate transportation or in work so closely related to it as to be practically a part of it?", citing **Shanks v. Delaware, Lackawana & Western R. R. Co.**, 239 U. S. 556, 558.

In a later case, **Southern Pacific Co. v. Industrial Accident Commission**, 251 U. S. 259, 64 L. Ed. 258, 40 Sup. Rep. 130, 10 A. L. R. 1181, the Supreme Court cites the **Pedersen** case, the **Shanks** case, and also **N. Y. Central R. R. Co. v. Porter**, 249 U. S. 168, and **Kinzell v. Chicago, M. & St. P. R. Co.**, 250 U. S. 130 and says: (op. 263)) "Generally, when applicability of the Federal Employers' Liability Act is uncertain, the character of the employment in relation to commerce may be adequately tested by inquiring whether, at the time of the injury, the employee was engaged in work so closely connected with interstate transportation as practically to be a part of it."

Applying the true principle of these Supreme Court decisions to the facts concerned here, it is found that the plaintiff, serving as he was as night-watchman to protect all the property and equipment at an employer's plant where interstate commerce goods were produced and also performing the additional duties of firing an engine so as to keep up steam and have the engine ready each morning for use in connection with interstate commerce, was in actuality engaged in the production of goods for interstate commerce within the meaning of Sections 6 and 7 of the Fair Labor Standards Act of 1938. Certainly, Congress intended no such unjust discrimination against a night-watchman, situated as was the plaintiff in the instant case, as would result from an unjustifiably narrow interpretation of the humane Fair Labor Standards Act.

(2) Finally, it must be determined whether the plaintiff falls within the exemption contained in Section 13 (a) (2) of the Fair Labor Standards Act. Was he "engaged in any retail or service establishment the greater part of whose selling or servicing is in intrastate commerce?" The defendants maintain that he was; and have presented several state decisions differentiating between wholesale and retail business under tax laws. The following of these authorities have been examined: **Albuquerque Lbr. Co. v. Bureau of Revenue of N. M.**, 42 N. M. 58, 75 Pac. (2d) 334; **Commonwealth v. Gormly (Pa.)** 34 Atl. 282; **State v. J. Watts Kearny & Sons**, 181 La. 554, 160 Sou. 77; **State v. Christhilf** (Md.) 185 Atl. 456; **Lone Star Cement Corp. v. State Tax Commission** (Ala.) 175 S. E. 399; **Wiseman, Comr. v. Gillies** (Ark.), 96 SW (2d) 459; **Blome Co. v. Ames**, 365 Ill. 456 6 N. E. (2d) 341; **Mason Lbr. Co. v. Lee** (Fla.) 171 Sou. 332.

The authorities listed above apply a variety of state taxation laws to varying circumstances involved in the operation of numerous diverse business enterprises. Taken all together, or separately, these opinions are of small value to correct adjudication on the point of law here presented. The most pertinent case on the list is **Mason Lbr. Co. v. Lee**, supra, in which it was held that bulk sales of lumber and building materials by retail lumber yard operators to contractors who transfer such materials to property owners in performing construction contracts were not "retail sales" within the meaning of the Florida Chain-Store Tax Act of 1935.

Whether Section 13 (a) (2) applies must be determined in each case, upon all the facts shown in the record. Certain commonsense considerations, however, are appropriately applied as criteria in all cases. Among these, it is obvious that the applicability of Section 6, covering minimum wages, and of Section 7, covering maximum hours, depends upon the nature of the **employment of the individual employee**; while the exemption provided in Section 13 (a) (2) depends upon the nature of the **business conducted by the employer.**

Another obvious distinction, between Section 6 and 7 on the one hand and Section 13 (a) (2) on the other, is that, under the former, some employees in any given business enterprise may be covered by the Fair Labor Standards Act and others not; while, under the latter section, all the employees of the industry are exempted, if any are.

It therefore follows that the defense based upon the exemption provided in Section 13 (a) (2) is sound only if it appears that the real defendant is a "retail or service establishment, the greater part of whose selling or servicing is in intrastate commerce." By no stretch of the imagination could either the Fischer Lime & Cement Co. or its trade-name branch, Central Sand & Gravel Co., be called properly a "service establishment." The defendants do not operate barber shops, beauty parlors, shoe-shining parlors, clothes pressing clubs, laundries, automobile repair shops, or the like. In its interpretative bulletin No. 6, issued Dec. 7, 1938, the Wage and Hour Division of the Department of Labor has defined a "retail establishment" as one which "sells merchandise to the ultimate consumer for direct consumption, and not for purposes of re-sale in any form."

This definition does not appear to be sufficiently comprehensive. Indeed, the Department of Labor, itself, seems to recognize that it is not; for in its Release No. R-116, Dec. 7, 1938, this statement appears: "A retail establishment generally sells its merchandise in small quantities and at prices higher than the price involved in sales to wholesalers or jobbers. Thus, for example, it would seem that a coal company engaged in selling larger orders of coal at a discount from the regular retail price would not be a retail establishment under Section 13 (a) (2), notwithstanding the fact that the coal is purchased for direct consumption and not for purposes of re-sale in any form."

It is hard to conceive that the defendant in the instant case can be regarded as a "retail establishment." In plain English, Webster's New International Dictionary, Second Edition, Unabridged, defines "retail" as "the sale of commodities in small quantities or parcels," and "wholesale" as "the sale of goods by the piece or in large quantities." A large building material and supply house which shipped by rail in interstate commerce to one customer, in two days, eight car loads of gravel could not be correctly said to be selling in small quantities. Nor could such supply house be deemed a retailer, when the major portion of its sales—many in bulk lots—were made to a city of more than 250,000 inhabitants, to a large State, to an important governmental agency, the Works Progress Administration, and to many contractors who use the material in their construction work.

Conceding that the defendant, Fischer Lime & Cement Co., in its entire business as well as in its trade-name branch dealing in sand and gravel, makes many retail sales; yet, if it also does a substantial wholesale business, its business taken as a whole should not be considered a "retail establishment" within the meaning of the exemption provided in Section 13 (a) (2) of the Fair Labor Standards Act of 1938.

(Signed) JOHN D. MARTIN,
United States District Judge.

Seek Light on Lime

National Lime Association's 38th annual convention of the lime industry developed a lot of information

By NATHAN C. ROCKWOOD

THE Chicago convention of the National Lime Association, May 21-23, came so close to press day that we must confine our story here to a brief summary—with more details in later issues. The convention was a notable one in the amount of interesting and vital information developed, and it is to be regretted that more lime manufacturers did not avail themselves of the opportunity to profit from the discussions.

Officers Elected

All officers and directors elected a year ago were reëlected except for District 15, where no election had been held to date. These officers are: Chairman of the board, K. L. Hammond, Keystone, Ala.; president and general manager, S. Walter Stauffer; secretary and assistant treasurer, W. Vernon Brumbaugh; treasurer, James H. McNamara, Eagle Rock, Va.; assistant secretary, Roma F. Medford. In addition to the chairman named, the executive committee are Henry LaLiberte, Duluth, Minn., past-chairman; Fred Witmer, Woodville, Ohio; Bernard L. McNulty, Chicago, Ill., past-chairman; Reed C. Bye, Philadelphia, Penn.

Several addresses might well have been grouped under the theme of "Trying to make business men understand and accept their responsibilities to society, if we are to continue our society on a democratic, capitalistic basis." The various speakers represented quite different points of view.

CLARENCE B. RANDALL, vice-president, Inland Steel Co., Chicago, Harvard graduate in law, represented what may be termed the younger, intellectual type of business executive—men of liberal education and point of view, in contrast to the older diehards of the self-made Bourbon type. Mr. Randall made a very earnest and sincere plea to business men to recognize change and to continue to keep our system of free enterprise, which he held to be the keystone of our democratic form of government.

WILLIAM F. DINNEN, attorney, Federal Trade Commission, Chicago, discussing "The Workings of the Federal Trade Commission," gave a clear description of the machinery of the commission and its intents and purposes insofar as he is able to interpret them. A later speaker described Mr. Dinnen as the most open-minded member of the Federal Trade Commission's staff, so probably his de-

Left: Fig. 1: Bernard L. McNulty introduces Clarence B. Randall, vice-president, Inland Lime & Stone Co.

Fig. 2: Mr. Randall makes luncheon address

Fig. 3: K. L. Hammond, chairman of the board of directors, secretary W. Vernon Brumbaugh (left)

Fig. 4: Wm. F. Dinnen, attorney, Federal Trade Commission

Below: Fig. 5: Notable members don't hesitate to take front row seats

scription did not jibe with the experiences of some of his listeners.

It was evident, however, that there is much constructive material in the so-called anti-trust and fair trade laws if it can be made to work to protect honest industry from piratical competitors without stifling highly desirable competition among "on the level" competitors. Perhaps the solution lies fully as much with business men as with government. Mr. Dinnen's paper is worthy of close study, when published by the association.

DR. CHARLES COPELAND SMITH, ex-clergyman, employed by the National Manufacturers' Association as a lecturer or orator, presented quite eloquently the much publicized point of view of organized American industry. His talk was preceded by a showing of the N.A.M.'s sound picture, "The Story of America," designed to drive home some of the fundamentals of our system of private enterprise. Dr. Smith's address, very pleasant to listen to, was on the theme of the great good fortune of being Americans.

DR. R. W. STONE, professor of industrial relations, University of Chicago, in his address "Industrial Relations — The Problem — a Program" presented quite a gloomy picture of America and democracy in general because of our failure to understand what is wrong in industrial relations. To date, he said, we had been merely treating symptoms, or details, not the disease, thus making the trouble worse—in fact, he said: "To date we have failed, the industrial system is the most completely unsatisfactory of any time. Workers were never so dissatisfied as today." All this in spite of the fact that our standard of living has increased many times. The proof of our failure, he said, is the fact that we still have 10,000,000 unemployed and no plan to put them to work. (He is not a New Dealer.)

Dr. Stone laid a large part of our failure to not understanding that work is a way of life as well as a means of livelihood; to a conflict between the engineering definition of efficiency and the cultural definition of efficiency. Industry has leaned too much to the engineering side of efficiency, he said. Effective use of human resources, he said, was the key to the solution of the problem.

Labor problems, he said, have hitherto been treated as of an economic nature almost entirely. Industrialists have failed to recognize industry as a human and social institution. Specialization and the interdependent systems of production tend to make the individual worker a nonentity; he feels this, rebels against the system—being one one-fifty-millionth part of society, etc. He must think of himself as of a person of importance, etc.

So much for the gloomy picture; proceeding to the professor's cure: A major cause of trouble is the business cycle and the way to meet it is to have flexible prices (prices here include wages, taxes, salaries, etc.). The theory of lack of purchasing power as a cause of depression is all wrong, the cart before the horse. We never lack markets for consumer goods. Everything is done to bring about rigidity of prices instead of flexibility. Business men, he urged, should organize by locality to coöperate with the U. S. Employment

Below: Fig. 6: Rear: Henry LaLiberte, past-chairman; front (left) Fred Witmer and G. I. Purnell

Right: Fig. 7: A table with many figures is referred to by Prof. Howard Staley

Fig. 8: S. B. Kanowitz discusses pulverized coal

Fig. 9: Victor J. Azbe reports progress toward the "perfect lime plant"

Fig. 10: E. N. Nicolson describes electric-shock hazards of quarry shovels

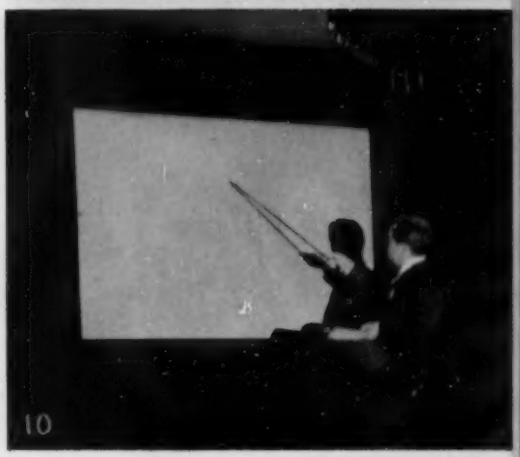


Fig. 11: Dr. G. L. Clark expounds X-ray analyses of lime. Fig. 12: Henry A. Huschke explains agricultural lime movie. Fig. 13: Russell Rarey presides

Service to provide an efficient labor market; our present labor market is of a medieval kind.

Dr. Stone gave 10 rules for foremen, as the only type of executive who actually got in close touch with workers; briefly these were: (1) don't make promises; (2) don't lie; (3) listen, always keep an open mind; (4) free and full discussion; state nothing but ask questions; (5) keep your temper; (6) postpone judgments; (7) don't stick your neck out and keep workers from sticking theirs out; (8) always tell "why"; (9) find the natural leaders of workers and find out through them what workers are thinking; (10) talk before you act; right timing is of utmost importance. He said you can't argue with workers in a strictly logical way; you've got to satisfy them as people.

Operating Practices

E. L. Nicolson, application engineer, General Electric Co., explained in detail, with the aid of lantern-slide charts, the hazards that exist in the use of electrically-driven quarry machinery, unless proper safeguards are used. These were described, more briefly, in Rock Products, November, 1939, p. 32.

S. B. Kanowitz, Raymond Pulverizer Division, Combustion Engineering Co., discussed the use of pulverized coal for calcining limestone in rotary kilns, with particular reference to kilns fired direct from unit pulverizers. He said that lime was more apt to be contaminated with sulphur from producer gas than from coal pulverized in a Raymond Bowl mill, because the sulphur is usually in the form of pyrites, which are harder to grind than coal, and the mill may be adjusted to throw them out. He said the fineness of grind depended on the coal, but the residue on the 50- or 60-mesh was of more importance than the amount through the 200-mesh.

Mr. Kanowitz gave the costs of typical installations and some operating experience. He does not favor very long kilns, thought 225 ft. long enough. With such a kiln, he said, a lime-fuel ratio of 4.2 to 1 was possible; it is the ratio based on a season's operation which counts and not merely the ratio during a test period.

Victor J. Azbe, consulting lime plant engineer, summarized and generalized some of the data that have been published in his "Lime Forum" in Rock Products from time to time, with much new and interesting material. This paper will be published in Rock Products for July.

Dr. G. L. Clark, professor of chemistry, University of Illinois, gave an exceedingly interesting explanation and summary of the X-ray studies of lime and hydrate made by him, Dr. Bradley and Victor J. Azbe. These studies and some of the tentative conclusions were published in Rock Products, January, 1940, p. 31. It would not be possible here to go into much greater detail without the aid of Dr. Clark's lantern slides; but he did make a subject which is abstruse to ordinary laymen quite clear and interesting. He emphasized that only a beginning had been made and great possibilities are before the lime industry to know something about the peculiarities of lime.

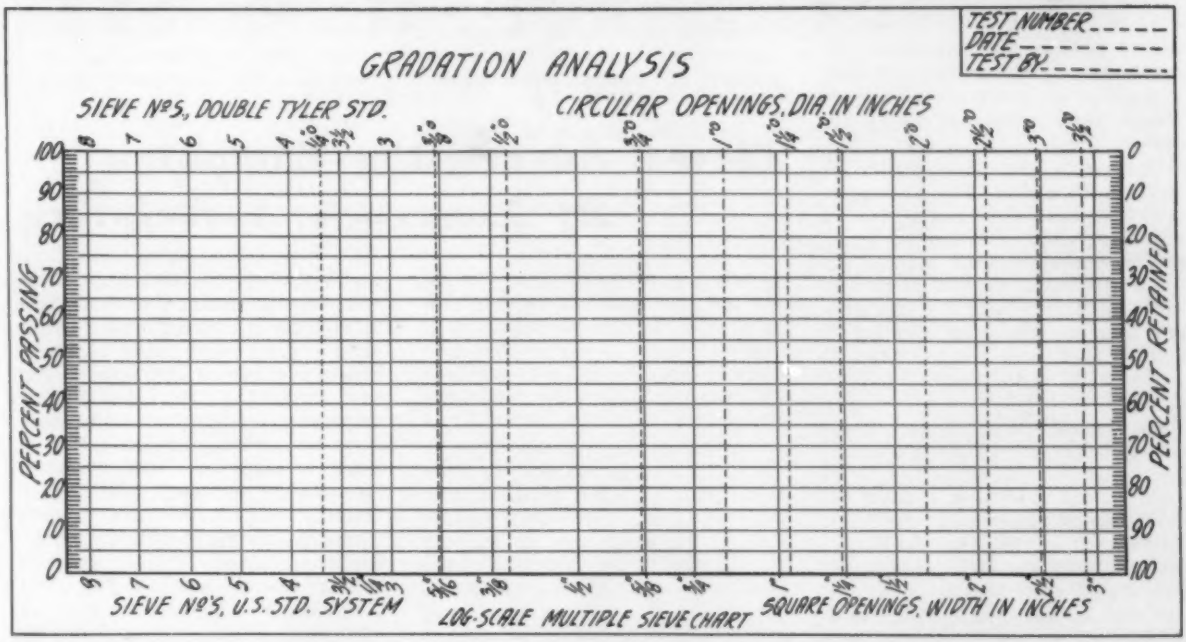
Promotion and Markets

Dr. James R. Withrow, professor of chemical engineering, Ohio State University, spoke on "Can the Lime Industry Learn from the Development of Chemical Textile Fibres?"—Dr. Withrow's talk did not deal with the

(Continued on page 46)

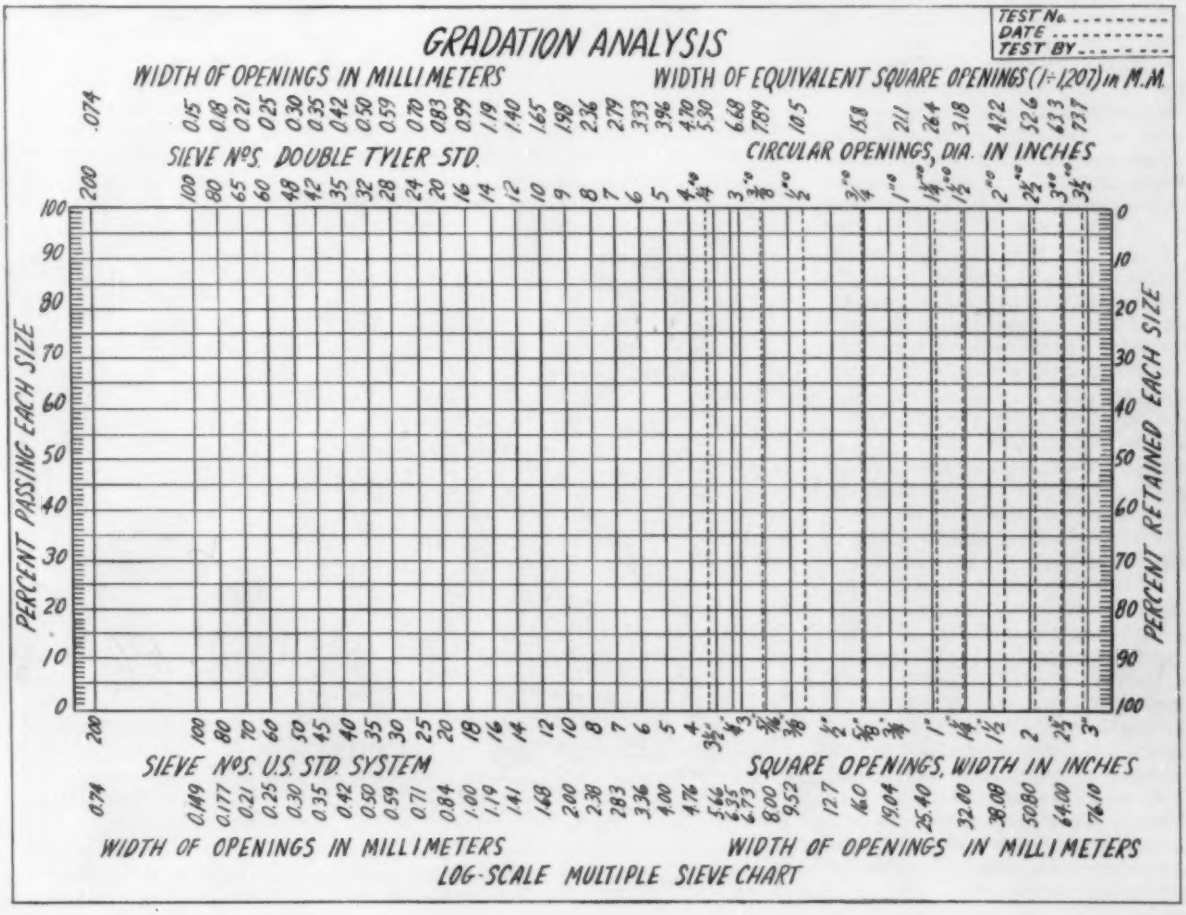
Fig. 14: Dr. Johnson B. Hester, agricultural lime expert. Fig. 15: Sherman D. Leseane opens up vista of new markets for lime for highway sub-base stabilization. Fig. 16: Dr. James R. Withrow tells how textile fibre industry progressed through research

CHARTS TO PLOT ANALYSES OF MATERIALS



Above: One of the gradation analysis charts developed by R. E. Fowle, engineer, Granite Rock Co., Watsonville, Calif. They have been found valuable in plotting analysis of different materials and mixes

Below: Another gradation analysis chart used by this company which was made up from data in a series of articles by the late Edmund Shaw in ROCK PRODUCTS. This chart also shows openings in millimeters


TEST No.
DATE
TEST BY
GRADATION ANALYSIS
WIDTH OF OPENINGS IN MILLIMETERS
WIDTH OF EQUIVALENT SQUARE OPENINGS (1=1.207) in M.M.
SIEVE Nos. DOUBLE TYLER STD.
CIRCULAR OPENINGS, DIA. IN INCHES
PERCENT PASSING EACH SIZE
PERCENT RETAINED EACH SIZE
SIEVE Nos. U.S. STD. SYSTEM
SQUARE OPENINGS, WIDTH IN INCHES
WIDTH OF OPENINGS IN MILLIMETERS
WIDTH OF OPENINGS IN MILLIMETERS
LOG-SCALE MULTIPLE SIEVE CHART

Seek Light on Lime

(Continued from page 44)

use of lime in the manufacture of textile fibres, but was designed more to describe the progress made in the textile industry through applied research.

SHERMAN D. LESESNE, chemistry instructor, Oklahoma City University, described experiments and experience with lime as a stabilizer of heavy clay or gumbo subbases, preparatory to highway surfacing; indicating that hydrated lime is better for this purpose than any other stabilizing agent. Enough experience has been gained on Texas highways to develop a technique.

Mr. Lesesne said it is generally accepted by highway engineers that before a roadbed will hold up traffic it must have a minimum stability of 250 lb. per sq. in., tested by the Proctor method; some specimens recently taken from lime-treated road bases have tested up to 3500 lb. per sq. in. The clay is intimately mixed with 2 to 10 percent of hydrated lime, sprinkled to give the optimum condition of moisture, rolled and covered with a surface of asphalt or concrete before drying out. The treatment requires 100 to 200 tons of lime per mile.

LORAN D. GAYTON, city engineer, Chicago, said lime was to be used at the new filtration plant for the south side of the city of Chicago—the largest water purification plant in the world. Lime is to be added to assist coagulation for removal of impurities which are present.

HENRY A. HUSCHKE, agronomist, National Lime Association, showed a moving picture produced by the National Fertilizer Association to prove the value and economy of using lime and fertilizer on pastures.

DR. JACKSON HESTER, soil technologist, department of agricultural research, the Campbell Soup Co., described in much detail the advantages in the use of lime on the soils of the Eastern coastal plains.

WALTER C. VOSS, professor of building construction, Massachusetts Institute of Technology, brought his studies of the use of lime in concrete up to date. These studies are being made with various details governed by suggestions of A. T. Goldbeck and Stanton Walker, research engineers for the National Crushed Stone Association and National Sand and Gravel Association, respectively. Prof. Voss' chief conclusion seemed to be that different hydrates act differently, and the one he used didn't give as favorable results as some others might have given.

HOWARD R. STALEY, assistant professor of building construction, Massachusetts Institute of Technology, reported the continued research on masonry and mortar characteristics. He said volume changes were particularly undesirable; that lime-cement mortars exhibit smaller volume changes both in hardening and afterward than portland-cement mortars.

Clever Advertising Campaign By Limerock Association

LIMEROCK ASSOCIATION of Florida, Inc., was organized early in 1939 by a group of limerock producers in Central Florida to carry out a program of educational and promotional activities to stimulate the application of limerock road base material.

The Association has its office in Ocala, Fla., under the able direction of Leon B. Thrasher, manager, who has had a wide and varied experience in the application of limerock for the past 20 years while with the Florida State Highway Department.

For 16 years Mr. Thrasher had been stationed at Ocala as division engineer and had witnessed the first application of Ocala limerock on a state road. In his new work, Mr. Thrasher spends considerable time in travel contacting users and prospective users of the material.

To supplement this personal contact work, Associated Advertising Agency of Jacksonville, Fla., was engaged to prepare an advertising program of practically statewide coverage which is now in effect. Advertising is directed toward municipal, county and state agencies which purchase road material and at present is carried in two Florida magazines, 106 weeklies and 30 daily newspapers. Space of half pages or more, stressing the advantages of limerock are appearing regularly in "Florida Public Works" and "Florida Municipal Record," two monthly publications having wide circulation among county commissioners and other public officials. This type of advertising is being supplemented by a direct mail campaign now under way through the guidance of the advertising agency.

Ten producers of limerock comprise the membership, embracing a shipping range from West Palm Beach, Fla., north in the state and west as far as Tallahassee. G. G. Ware, Leesburg, Fla., is president; Alex Bresi, Jacksonville, secretary; and Norman Horne, Ocala, treasurer.

HOW to make your Highway Dollars Work Forever
THE Everlasting ROAD MATERIAL
LIMEROCK
LIMEROCK ASSOCIATION OF FLORIDA, Inc.
OCALA, FLORIDA
We need a better road system . . . but how can we get it without overburdening the taxpayer?
The answer is . . . LIMEROCK! Limerock-base roads cost less to build — less to modernize than any other permanent-type road. Build em with Limerock — and save present and future taxes!
A Clear Call for LIMEROCK
Send Today For FREE Booklet ABOUT LIMEROCK
How To Reduce Future Taxes
of Florida, Inc. OCALA FLORIDA

Typical samples of attention-pulling advertising by Limerock Association, of Florida, Inc.

Lime Kilns Like Battleships

Factors governing the capacity limit of vertical lime kilns follow definite physical laws

By VICTOR J. AZBE

BATTLESHIPS can plow through the ocean just about so fast and no faster, and the fastest are mainly just tremendous power plants. To get any more speed is just about impossible if there is any space to be left for guns and men. Most increases of speed come from greater concentration of power units; turbines, electric drives and high pressure, high capacity boilers, and from higher efficiency of these units. Therefore, the more bunker fuel space available the more horse power developed.

Of course, the power is needed to overcome friction, but friction varies as the square of the speed and power as the cube, and that all means that if speed is doubled, demands for power are not twice as great, or even four times as great, but rather on the order of eight times. Therefore, at the maximum every additional knot to be obtained demands a tremendous increase of power.

Battleships and lime kilns are in this way very closely related and the same laws seem to regulate both in their efforts to go places. It is the fluid friction that holds both back, while in one case it is water and air resistance that retards the immense bulk of the ship, in the other it is the resistance presented by the lime and stone to the flow of gases up through the kiln.

We can even lay down the law which would be, "Doubling the capacity, is doubling the gas velocity, which quadruples the friction and raises the power to eight times."

Practical Limitations of Shaft Kilns

Let's assume a lime kiln producing 60 tons of lime with 4 in. of draft and 15 hp. of fan power. If we just doubled everything in the expectancy of getting twice the lime, we would be greatly fooled because to get twice the lime, the draft would have to be increased to 16 in., which is impracticable and the fan power to 120 hp., which is even more so.

Or let's assume a more reasonable case, a 70-sq. ft. shaft area lime kiln, producing 70 tons of lime with 25 hp. of fan power. From 70 tons of lime to 100 tons is not so very far in capacity but draft required would double and power treble up to around 75 hp. Evidently 100 tons from a 70-sq. ft. shaft area is practically out of the question.

At one time, we thought that a lime production rate of 3000 lb. per sq. ft. of shaft area per day was possible, but that idea is now changed and the practical upper limit when gas firing with either producer or natural gas is about 2500 lb. per sq. ft., and obtaining even that will frequently not be possible.

LIME FORUM

Mr. Azbe is a contributing and consulting editor of ROCK PRODUCTS. He will be glad to receive inquiries from his readers, and will answer these direct or through the columns of this Forum.

This, of course, does not mean that 100-ton lime kilns are not possible. Eighty-ton kilns have been operating for quite some time. It just means that shaft areas have to be larger and so arranged that the charge can be handled properly.

But friction is not altogether a loss; in fact, the opposite is true. We could not get the very high capacities efficiently if it were not for the friction (draft loss) of gases over the lime surface. When velocity increases, heat transfer increases as it varies as 1.7 power of velocity. If it varied as the square of velocity, the only limitation to kiln capacity would be the rapidly increasing power, but as it is only 1.7 power, the heat transfer rate and amount of heat to be transferred are not exactly in step. Waste gas temperatures at the fan do increase some with increase of capacity, although slowly; in fact, so slowly that there is not much difference in efficiency of a kiln operating at the low rate of 1000 lb. and the high rate of 2000 lb. of lime per sq. ft. of shaft area.

At a 1000-lb. rate, the average terminal temperature may be 550 deg. F. and at 2000 lb., 750 deg F. If it was not for the 1.7 power increase of heat transfer, the terminal temperature at 2000 lb. would be far greater and efficiency quite low or the kiln would have to be much higher. Actually the slightly increased terminal temperature does not require any additional fuel, since through higher capacity radiation loss is reduced in proportion and the reduction of this loss balances out the slightly higher waste gas loss and the fuel rate per ton of lime remains the same.

There is another compensating factor. At the higher capacity, there is some increase in temperature of the products of combustion in the hot zone. This also aids heat transfer since the rate of limestone dissociation varies about as the difference of CO_2 tension of dissociating limestone and the gases supplying the heat, and this would indicate that the rate of heat absorption doubles about every couple hundred degrees of hot zone temperature rise.

It is such matters that make high kilns unnecessary, and if gases pass through about 35 ft. of height they will have done about all the work they ever will do. When stone is small, even this height is not needed. That is true, of course, if the hot zone temperature is high. If one goes in strongly for soft burned lime and low hot zone temperatures then active kiln zones will have to be somewhat higher or capacities lower.

Recirculation of Gases Hurts Kiln Efficiency

The only satisfactory way to lower temperatures is by dilution with waste gas, but not with comparatively cold stream from the kiln top, as ordinarily practiced today, which tends to lower kiln capacity and efficiency. The recirculating stream should be very hot.

Recirculation of gases always hurts kiln efficiency. It often was necessary, though, particularly with dolomite, mainly for the sake of lime quality. The harm came in because the tempering was more through heat abstraction and total loss, rather than dilution. If the recirculated hot gases are taken from over the calcining zone and diluted with air only to the

(Continued on page 51)

NEWS ABOUT PEOPLE

HOWARD R. STARKE, personnel manager and assistant to vice-president Earl MacDonald at the Crestmore, Calif, plant of Riverside Cement Co. has been named as general superintendent of the plant and is now in charge of plant operations. He has been connected with the company since graduation from California Institute of Technology as a mechanical engineer in 1927 and has had experience in practically all departments. He fills the vacancy created several years ago by the promotion of Mr. MacDonald to vice-president.

•

SEWELL L. AVERY, chairman of the board of United States Gypsum Co., Chicago, Ill., has been elected president and reëlected chairman of the board of Montgomery Ward & Co., Inc. He had filled the two offices prior to the election of Raymond H. Fogler, who recently resigned as president.

•

HOLCOMBE J. BROWN, consulting engineer and a recognized authority on non-metallic mining and mineral separation, has been elected a director of the American Institute of Mining

Holcombe J. Brown

and Metallurgical Engineers. For forty years he has been engaged in gypsum mining, manufacturing, plant design construction and operation.

Mr. Brown is also a member of the A.S.M.E. and last year was made president of the Engineering Societies of New England.

•

HARRY B. TURNER, veteran purchasing agent of the Portland Cement Association was presented with a

Harry B. Turner

silver coffee service on April 22 in appreciation of his 25 years of continuous service. Frank T. Sheets, president of the Association gave Mr. Turner the token in the presence of some 150 members of the Chicago general office staff. Mr. Turner came to the Association in 1915 when its headquarters were in Philadelphia and moved to Chicago when the general office was established there a year later.

•

V. P. AHEARN, executive secretary, National Sand and Gravel Association, has been appointed by Secretary Perkins a member of a special advisory committee of the U. S. Department of Labor on pre-employment medical examinations in industry.

JOHN FIERKE was elected vice-president of the Missouri Gravel Co., Moline, Ill., at their annual meeting. D. A. Childers also was elected a member of the board of directors to succeed the late W. E. Oyster.

•

J. REG. BOYD, administrative director of the National Crushed Stone Association, Washington, D. C., is reported to have won about $200 worth of golf equipment at a tournament held in connection with the May meeting in Washington of the American Road Builders' Association. The "way we heerd it" those in charge decided to depart from the usual method of awarding the principal prize to lowest net, or worst dub, etc., and to give it to some average golfer in some way. So they added up all the scores and divided by the number of players to get the average score. It was 104 (ain't that awful!) and that just happened to be Reggie's score. So, when you see his new outfit you'll know how he got it.

•

JOHN P. SANGER, vice-president in charge of purchases of United States Gypsum Co., Chicago, will address the National Association of Purchasing Agents convention in Cincinnati, June 3 to 6 on "Utilizing Transportation Facilities to Lower Costs." He is also convention program chairman.

•

D. M. PENDERGAST, secretary and treasurer of Geo. M. Pendergast & Co., Milwaukee, Wis., silica sand producer, is none other than a primly dressed, tiny woman. Foundrymen learned this at the recent 44th annual exposition of the American Foundrymen's Association in Chicago although many have known her as "D. M. Pendergast" for the more than twenty years she has been in the business.

The "D" stands for Dorothy. She really is Mrs. George M. Pendergast and acts as a business partner with her husband, who is president of the company.

Mrs. Pendergast majored in business administration at Marquette university, and several years after graduation had worked her way into a position as an office manager. From this she saved money to go into the sand brokerage business with a man partner. Then she met George M. Pendergast, who managed a chain of theaters. After a while he quit the theaters and bought out her partner's interest. The company now has 12 operating units in five states. Mrs. Pendergast manages the office and her husband supervises operations.

(More news appears on page 88)

Fluxes and Their Influence on Burning Clinker

ARTICLE TWO

Comparative results in shaft and rotary type kilns using different combinations of raw materials and fluxes

By STEVEN GOTTLIEB*

AFTER A NUMBER OF YEARS of practical experience, a series of comparative tests were carried out for the purpose of obtaining specific data on fluxes. These tests were carried out in an oil-fired laboratory furnace and a complete study made of the degree and rate of combination by using different raw materials. The furnace was constructed in such a way, that in an inner volume of about 1 cu. ft., it was possible to obtain temperatures up to 2700 deg. F. and firing could be so regulated that inside this exceptionally large firing room the uniformity of temperature was well maintained. (No greater changes than ± 10 deg. F. occurred.) The small temperature inaccuracy recorded was negligible because of the way in which the tests were carried out; namely, three raw mixes** were to be tested in comparison and about 30 lb. of clinker were to be prepared from each mixture. Thus 140 lb. raw mix had to be burned moulded as briquettes of the same size (2- x 3-in.). As the capacity of the furnace was only about 15 lb., burning had to be repeated many times to get the necessary quantity of clinker. At each burning equal quantities of *all* the three raw mixes were put into the furnace, the order of the set briquettes being always changed, thus small differences in temperature inside the furnace-room were of no importance for the final sample, which was burned in 10 portions or more, was then mixed together and ground. Rate of heating, maximum temperature and cooling were very uniform at each burning. (Graph No. 5.) The fuel used had practically no ash content. The bottom slab of the furnace consisted of magnesia firebrick which has shown that it is perfectly nonsensitive against sintering raw mix.[10]

The chemical composition of the raw material constituents to be tested were as follows:

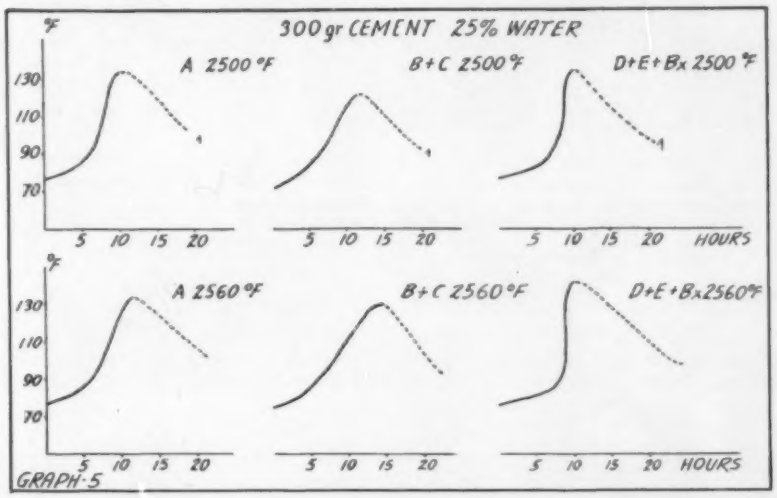
	Argillaceous lime (marl) "A"	Hard limestone of pliocene form "B"	Clay "C"	Soft chalk of eocene form "D"	Flint "E"
$CaCO_3$	76.5%	96.2%	18 %	86.2%	38.0%
SiO_2	15.4%	3.2%	51.2 %	16.1%	70.8%
Al_2O_3	3.9%	0.6%	13.2 %	2.2%	0.4%
Fe_2O_3	1.8%	0.5%	6.2 %	1.2%	1.2%
Silica-modulus:	2.6	2.9	2.64	4.7	(40.7)
Alumina-modulus:	2.2	(1.2)	2.11	1.8	(.04)

The flint (E) was very closely combined with the chalk in the quarry, consisting of large inclusions between layers of soft chalk (D) the separation of these two constituents proving very difficult. Hard limestone (B) and clay (C) were found in large quantities without impurities. The chemical composition of the argillaceous lime (A) equals the composition of a good cement: this composition being very uniform, (A) could be used in practice without any addition.

Experiments With Bauxite Used as a Flux

In the laboratory tests, a raw mix consisting of A and mixtures of the constituents B+ C and D + E of the same composition as A were tested. In order to obtain this chemical composition, bauxite with 74 percent Al_2O_3 and 20 percent Fe_2O_3 had to be added to D + E.

The composition and fineness of the test raw-mixes were as follows:



Graph 5: Cements burned from raw mixes A, B+C and D+E+Bx at 2500/$_5$ and 2560/$_{20}$. Evolution of heat during hardening in Dewar vessel

* Chief Chemist, The Portland Cement Co., "Nesher" Ltd., Haifa, Palestine.

** See ROCK PRODUCTS, May, p. 47.

Raw mix No. 1	Raw mix No. 2	Raw mix No. 3
100% A	73% B 27% C	86% D 12.6% C 1.4% Bauxite
72% minus 170 mesh	78% minus 170 mesh	78.5% minus 170 mesh

For the purpose of observing the various stages of the clinkering process, all samples were burned at different temperatures, producing in each case about 60 lb. of clinker from all three raw mixes. On reaching the maximum temperature desired at a time, it was maintained for a certain period and then cooled off. To explain the tests, this period is given together with the temperature: namely 2460/5 means, that the maximum temperature of 2460 deg. F. acted for five minutes, then it was cooled down at a rate shown in Graph No. 5. In consequence of the large quantity of clinker burned, grinding could be better controlled and uniform cement fineness obtained. Clinkers were ground in the laboratory mill under carefully controlled conditions, thus uniformly 2000 sq. cm., per gram specific surface area was obtained for all clinkers. The results of investigations are shown in Tables Nos. 6, 7 and Graph No. 8.

From those comparative experimental burning series it may be concluded that it was not mix D + E + Bx produced by adding a flux (Bx = bauxite) that was easiest to burn, but mix A, which did not contain any admixture at all. With the latter, free lime disappears at 2460 deg. F. almost entirely under the given time conditions; the free lime quantity shows at 2280 deg. F. a more advanced reaction compared with the other two samples. The quality of the clinkers sharply burned at the latest stage was the same, as anticipated with equal chemical compositions. An exception was the heat evolution during hardening, which was higher at D + E + Bx.

The experiments prove that the raw material constituents of the mixes B + C and D + E + Bx were less reactive at the lower burning stages than A. The fact was also striking that in all trial burnings, mixes of the composition A retained their forms despite great shrinkage of volume during the evaporation of water, dissociation of carbonates and sintering, while the other clinker-samples burned from material-constituents B, C, D and E were full of flaws which sometimes stood ½ in. apart.

CHEMISTS' CORNER

Problems and practices of the chemists in the industry are discussed on these pages. Contributions and comments are invited.

For several months an opportunity presented itself of observing simultaneously the raw material types B + C in a shaft kiln battery consisting of six kilns, and the same opportunity was also given in an oil-fired rotary kiln of the same plant. The latter, worked on the thick-slurry method, was 335-ft. in length, with 10-ft dia. enlarged burning zone and heat exchange chains at the feed end. Exhaust gases were drawn with a motor driven louvre damper having automatic draft control. The fuel used had a calorific value of 19,800 B.t.u. per lb. and practically no ash content. The raw material mixture was ground to thick slurry in a 4-compartment wet mill 7 ft. dia. and 33 ft. length and blended in slurry storage bins to the desired chemical composition to a high degree of precision.

Rotary vs. Shaft Kilns

The burning with B + C in the rotary kiln was entirely uniform. The coating of the kiln lining which, after starting the kiln was burned on to the burning zone held up exceedingly well, so that it was possible to work with clay firebricks in the burning zone for almost two years at maximum kiln capacity. Owing to the comparatively small quantity of water required for the thick slurry consistency, heat economy was favorable.

Shaft kilns worked less successfully with the same material, the cost of production being higher than with the rotary kiln due to the larger personnel and relatively smaller capacity. Clinker quality was inferior to that produced by the rotary kiln. The maximum lime saturation value which could be maintained while keeping good soundness, was about 91 percent.

The comparison between the two kiln systems, however, furnished quite different results when raw material of the type (A) was used. Burning in the rotary kiln only showed a difference as compared with the raw material combination B + C, the ma-

TABLE 6: CHEM. COMPOSITION OF CLINKERS BURNED FROM RAW MIXES A, B+C, D+E+Bx AT DIFFERENT TEMPERATURES IN THE LABORATORY FURNACE

Clinker burned from							Free lime content at burn. Temp. F°					Potential Compound Composition of Clinkers burned at 2560/2,					Heat of Solution of Clinkers burned at: (Calories/gr.)		
Raw mix	Ign.loss	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	2280/5	2370/5	2460/5	2500/5	2560/2,	C_3S	C_2S	C_3A	C_3A_3	C_4AF	2460/5	2500/2	2560/2,
A	0.30	22.54	5.62	2.91	66.62	1.97	6.2	1.8	0.6	0.1	0	60.5	19.3	8.3	1.5	9.0	643	617	640
B+C	0.32	22.80	5.26	3.46	66.62	1.51	9	3	1.7	1.1	0.2	57.7	22.1	8.0	0	10.7	650	640	639
D+E +Bx	0.50	22.72	5.52	2.89	66.66	1.56	8.3	3.4	1.1	0.7	0.15	59.4	20.4	8.2	1.3	9.0	649	629	637

TABLE 7: PROPERTIES OF CEMENTS BURNED FROM RAW MIXES OF THE SAME CHEMICAL COMPOSITION BUT OF DIFFERENT RAW CONSTITUENTS*

Burned from	Weight per litre	Setting Time water	Init.	Final	Soundness Lechatelier	Bending strength (11% water) plastic consistency 7 days	28 d. water	28 d. comb.	Crushing strength (8% water) earth moist consistency 7 days	28 d. water	28 d comb.
A	1115 gr.	26.4%	3:50	5:15	0.5 mm.	632 lbs./in.²	673 lbs./in.²	930 lbs./in.²	4860 lbs./in.²	8260 lbs./in.²	8260 lbs./in.²
B+C	1120 gr.	26.2%	3:10	4:30	2.0 mm.	542 lbs./in.²	665 lbs./in.²	714 lbs./in.²	4140 lbs./in.²	7100 lbs./in.²	7140 lbs./in.²
D+E +Bx	1110 gr.	26.3%	3:40	5:15	1.0 mm.	551 lbs./in.²	667 lbs./in.²	782 lbs./in.²	4800 lbs./in.²	8350 lbs./in.²	8280 lbs./in.²
A	1115 gr.	26%	5:00	5:45	0 mm.	583 lbs./in.²	716 lbs./in.²	830 lbs./in.²	5530 lbs./in.²	8260 lbs./in.²	8850 lbs./in.²
B+C	1110 gr.	26%	4:00	5:45	0.5 mm.	546 lbs./in.²	665 lbs/in.²	796 lbs./in.²	4060 lbs./in.²	7660 lbs./in.²	7760 lbs./in.²
D+E +Bx	1120 gr.	26.2%	4:30	5:30	15 mm.	595 lbs./in.²	716 lbs/in.²	764 lbs./in.²	5380 lbs./in.²	7370 lbs./in.²	7800 lbs./in.²

* Inner surface area for all mixes was 2000 sq. cm. per gram, plus or minus 10 sq. cm. per gram. Burning temperature of first group of raw mixes was 2500/5 and for second group, 2560/2,.

terial requiring more water to obtain the necessary thick slurry consistency. In the case of shaft kilns, however, a particular improvement could be observed. Burning became more uniform, the efficiency of the kilns was considerably raised and the quality of the burned clinker equalled that burned by the rotary kiln. Thus, by showing its actual behavior in automatic shaft kilns, the great importance of raw material (A) could be proved. (Table No. 9.) It became possible to operate at maximum capacity with a heat consumption of 650,000 B.t.u. per bbl. clinker. The maximum lime saturation value at which good soundness could be held, was 97 percent. Nearly the same satisfactory results could be obtained in the shaft kilns if, besides (A), the raw constituents (D) and (E) were admixed with a certain amount of iron oxide to keep the silica modulus normal. When, however, the content of (A) in the raw mix fell below 70 percent, difficulties in the shaft kilns recurred again.

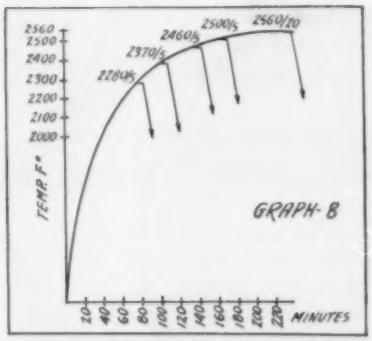
Thus, practical experience corroborated the results obtained in the laboratory to a high degree. The rotary kiln was not sensitive to various raw material combinations of equal chemical composition, except some trifling fluctuations in heat consumption due to different water content in the slurry. Material (D) tended to form dust rings following the heat exchange chains, yet experience was too short to pass a definite opinion in the matter.

Shaft kilns on the other hand were very sensitive to variations of raw constituents; with certain kinds of materials burning was difficult and expensive, but with other types it was unusually favorable. The special burning advantages of such materials could be used in shaft kilns so profitably that the larger personnel employed and other circumstances involving additional expenditure of the shaft kiln process could be more compensated. The quality of the burned clinker was uniform, and represented the limit that could be reached on the basis of the given chemical composition.

The difference in the behavior of raw materials of different physiochemical state was therefore of great importance for practice. It must also be pointed out that the raw mix was expected to meet various requirements which were different when various kiln systems were in operation. In the case of shaft kilns, the briquettes had to be of good resistance to wear lest they should crumble down when fed into the kiln. They must acquire high porosity and good strength in the calcining zone to allow the water and CO_2 to leave easily and to effect thorough burning without difficulties. With the rotary kiln, the raw mix had to consume not too much water for the slurry; the dehydrated and partially calcined material should not dust but must form balls of good mechanical resistance. The ability to burn a good coating on the lining is influenced both by the properties of the raw mix and the quality of firebricks used in the burning zone.

TABLE 9: AVERAGE RESULTS OBTAINED BY USING DIFFERENT RAW MATERIAL CONSTITUENTS IN:

	Shaft Kiln Plant Raw mix consisting of A	Shaft Kiln Plant Raw mix consisting of B+C	Rotary Kiln Plant Raw mix consisting of A	Rotary Kiln Plant Raw mix consisting of B+C
	briquettes ("earth moist" cons)		Thick Slurry	
Water (in %) required for:	16	14.5	48	42
Fuel consumption B.t.u./bbl. Cement	650,000	920,000	1,150,000	1,050,000
Cement fineness: Spec. surface area weight per litre in grams	approx. 1800 cm.²/gr. in all cases			
	1010	990	1025	1015
Setting time: Water used for plastic consistency	25.6%	26.2%	25.6%	25.6%
Initial set at 65° F.	150 min.	120 min.	150 min.	150 min.
Final set at 65° F.	230 min.	210 min.	210 min.	210 min.
Soundness: Lechatelier test in m/m free CaO in Clinker	0 0.2%	1.5 1.8%	0 0%	0 0%
Tensile strength acc. to B.st. Specif. lbs/in²				
3 days	520	450	510	525
7 days	615	470	625	610
Crushing strength mortar with 8% water, lbs./in² ("earth moist" cons.)				
3 days	5460	4260	5530	5670
7 days	7080	5690	7440	7440
28 days water st.	9360	6950	9790	9560
28 days comb. st.	9780	8000	10050	10100
Bending strength mortar with 11% water, lbs/in² (plastic cons.)				
3 days	596	468	582	596
7 days	736	624	695	723
28 days water st.	908	822	908	886
28 days comb. st.	994	914	1002	990



Graph 8: Progress of heating raw mix in the laboratory furnace

BIBLIOGRAPHY

[10] Gottlieb, Cem. & Lime Manuf., IV March.

(To be continued)

Lime Kilns Like Battleships

(Continued from page 47)

point where temperature is 1000 deg. F., and a fan can handle them, then there will be no loss of lime making heat from the hot zone. All of the heat of high elevation will still be there, only spread over a much greater volume of gas, which will result in higher velocity and better heat transfer and so demand only a comparatively small increase in kiln height for the same capacity.

Incidental to all this is stone size, and one wonders how many realize that it requires as much time to burn out a 4-in. core in an 8-in. lump as it would to burn a 4-in. piece of stone; also, that most of the resistance to flow of gas comes not from the size of stone but rather from the lack of size uniformity. If rock were segregated and 2- to 4-in. and 4- to 8-in. rock fed separately to different kilns, then both kilns and lime would be better, power less, and the spall pile smallest. As it is draft that limits capacity, the capacity will be higher because uniform stone will give lower draft loss and better gas distribution, and the 4-in. lime will not have to wait for the 8-in. to have its 4-in. core calcined—wait twice the required length of time.

Hints and Helps

★ FOR SUPERINTENDENTS ★

Increasing Life of Dipper Teeth

DIPPER TOOTH LIFE has been increased over one-third at the Weston and Brooker Co. plants at Columbus, S. C., and Camak, Ga., with development of a new tooth by the Kensington Steel Co., in coöperation with engineers of the stone company. The company had been using the standard design of dipper tooth with a sharp point or ⅛-in. radius. Owing to the small amount of metal in the point of the tooth, the wear was very rapid in loading hard granite.

Manganese steel ordinarily has a Brinell hardness of about 190, which may increase up to 500 when it is subjected to impact, but in the case of the sharp pointed dipper teeth the metal wore away faster than it could harden. By increasing the radius on the end of the point to ¾-in. and making a blunt tooth, more metal was provided at the end of the point to wear and the design was such that the manganese steel had a chance to work harden before it wore off. Life was increased for that reason—the more it work hardened the slower it wore.

The saving was accomplished without any increase in weight or cost of the tooth. Added metal in the point was taken away from the tooth in the center section where there is a concave face to the tooth. The design of tooth on which the process is applied is called the Smith Step-Type tooth. The contact between the points and bases is made in three steps, which provide more nearly parallel surfaces between the point and base than the average teeth do. This design is said to lessen the strain put on the pin that holds the point on

Showing new blunt dipper tooth on right as contrasted to worn tooth

and to simplify replacement. Kensington Steel Co. and Weston and Brooker Co. coöperated in the tooth design as well as the tip.

Surge Storage Permits Capacity Operation

RECOGNIZING that continuous operation at full capacity means economical operation, a surge system was installed by the Columbia Quarry Co. at Valmeyer, Ill., to insure an uninterrupted flow of stone to the screening plant from the quarry.

The surge storage, an open stockpile of 1250 tons capacity, separates the quarry operations from the plant and is the means of getting a capacity flow of stone, first broken by the primary crusher at the quarry, to the screening plant.

Engineers of the Stephens-Adamson Co. collaborated with Superintendent Fred Krewer in the design of the system illustrated. Advantage was taken of the natural terrain at the limestone mine entrance in providing a surge pile that is 100 percent live storage. Side-dump trucks dump directly into a gyratory crusher, which discharges onto an inclined stacking belt conveyor.

At the base of the surge pile, a 36-in. Stephens-Adamson pan feeder reclaims stone directly to a belt conveyor, which carries it to the plant. Savings of 4c per ton by virtue of maintaining uninterrupted high capacity operation paid for installation.

Magnetic Separation and Jaw Crusher Plates

AN INTERESTING PROBLEM WAS recently brought up by a producer who was crushing highly abrasive material in a 12- x 24-in. jaw crusher, using jaw plates of austenitic manganese steel. Tramp iron was removed from the product by magnetic separation, but as manganese steel is non-magnetic its use was undesirable because particles wear away in the crushing operation and could not be removed.

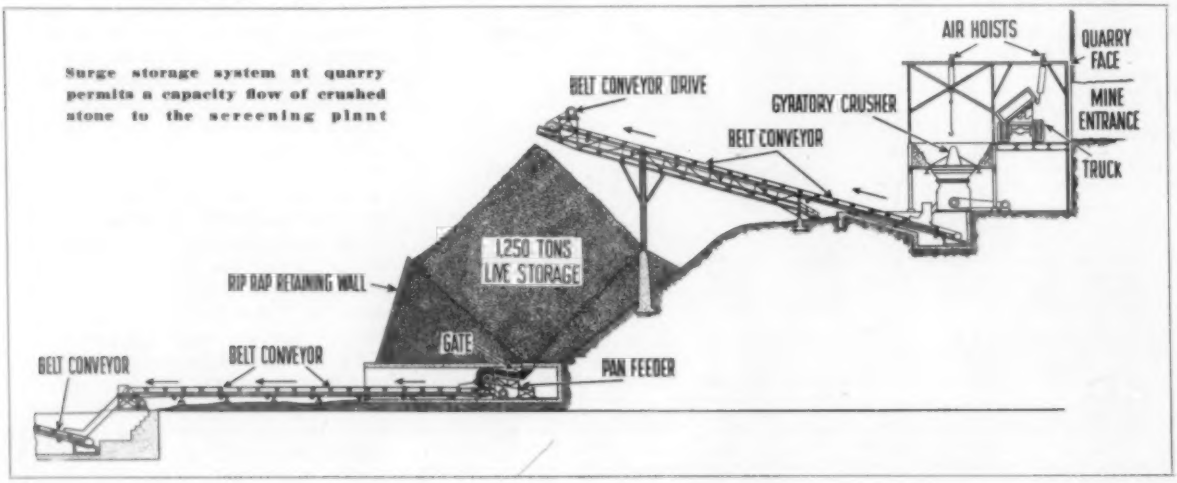
The solution of this problem was given in an item appearing in *Nickel Steel Topics*, from which the following is quoted:

"For most types of wear-resistant service, especially where impact or work-hardening is involved, austenitic manganese steel is the most satisfactory material, and the low alloy steels whose hardness results from heat treatment cannot usually be expected to provide service life equal to that of the high manganese steel.

"A low alloy steel which has competed successfully with manganese steel on various occasions conforms to the following composition:

Carbon (%)	1.10/1.25
Manganese	1.10/1.25
Silicon	1.00 Max.
Nickel	4.00/4.50
Chromium	1.50/2.00

Surge storage system at quarry permits a capacity flow of crushed stone to the screening plant



Left: Two-beam scale, hopper of bucket elevator to carry sand and lump lime to the upper floors, and in the background is the agitating tank and pump

Right: Suspended from the wall and held up by counterweight is the pipe for loading lime putty into trucks. To the right, suspended from the ceiling, is the lime mortar chute

"Castings of this type are heat treated by quenching in water from a temperature of 1850/1900 deg. F. This produces a structure somewhat similar to that of the Hadfield manganese steel, but the material is not entirely austenitic after quenching, and is hence slightly magnetic, so that it would not contaminate the product after going through the magnetic separation process.

"Another steel, wholly magnetic, which was suggested as meeting the requirements, contains:

Carbon (%)	0.40/0.50
Manganese	0.60/0.90
Nickel	2.25/3.00
Chromium	0.60/0.90
Molybdenum	0.25/0.35

"Selection of the composition should depend somewhat on the nature of the material being crushed. If the latter is extremely hard, it is probable that the high carbon steel first mentioned will not be sufficiently tough to withstand the impact encountered, and the second-listed composition should be adopted.

"If toughness is not a primary requirement, or if the hard surface is properly backed up, it is quite possible that the abrasion-resistant, chill-cast alloy iron known as 'Ni-Hard' may be employed. It has been used in the cones of gyratory crushers and in ball and rod mill liner plates."

Movable Rinsing Screen

STOCKBRIDGE STONE CO., Stockbridge, Ga., uses a 3- x 5-ft. vibrating screen to wash crushed stone at the point of discharge into railroad cars or trucks. The stone is reclaimed by belt conveyors direct from open stockpiles for loading. The illustration shows a device for raising the screen so that when a train of cars is pulled over the track the locomotive stack will clear the screen. The high end of the screen is hinged and held in place at the desired slope by the concrete counterweight to the right of the tracks. To raise the screen the weight is dropped into a cylindrical hole in the ground.

The April, 1940, issue of ROCK PRODUCTS, pages 34 and 35, contains a complete description of this plant. It

Counterweight pulls screen up to clear stack of locomotive passing over track centered below

is a small plant but has not missed an opportunity to improve operations by means such as that described above.

Preventing Spillage in Loading Lime Putty

LOADING LIME PUTTY into trucks by means of a chute is often a messy job, as the material is sufficiently fluid to have a tendency to splatter if it falls from any reasonable height.

The General Material Co., St. Louis, Mo., solved this trouble at their lime putty plant by pumping the material through a pipe having a flexible joint which permits lowering this section near the bottom of the truck body and then raising it as the level of lime putty reaches the top. The 4-in. pipe section is raised up out of the way of trucks backing in for a load by means of a pulley, cable, and counterweight. A threaded steel cap is screwed onto the end of the pipe after a truck is loaded to prevent any lime putty dripping onto the floor of the scale platform below.

It is a very compact plant, 20- x 32-ft. in plan and 48 ft. high, and advantage is taken of gravity as much as possible in handling materials. The lump lime tank at the top of the plant feeds lime by gravity to the 3-ton slaking tank below. A 4-in. Goulds centrifugal pump driven by a 10-hp. Fairbanks, Morse electric motor pumps the milk-of-lime from the slaking tank to three 100-ton capacity steel ageing tanks above.

From the ageing tanks, the material flows by gravity to a 6-ton revolving blade agitating tank on the ground floor. Another Goulds centrifugal pump driven by a 10-hp. Fairbanks-Morse electric motor pumps the finished lime putty either to trucks through the pipe line having the flexible joint loading pipe connection, previously described, or to the measuring hopper above the lime mortar mixer tank on the third floor. The lime mortar is discharged from the mixer into a day-storage tank on the second floor. Mortar is loaded into trucks by means of a swinging, hinged chute extending down into the driveway and held out of the way when not used by means of a counterweight. A pipe is not necessary for lime mortar as it is of heavier consistency and does not tend to splatter. Trucks load either lime putty or mortar while standing on a platform scale equipped with a double beam from which net weights may be read direct.

To keep the lime putty from leaking out of open type truck bodies, a supply of sand is kept in a box within convenient reach of the driver to spread lightly in the bottom of the truck body and corners.

The lime putty plant has a capacity of 200 tons a day. It is planned, however, to increase the ageing tank capacity. The building itself is a neat structure of concrete and steel with galvanized, corrugated sheet steel siding and roofing.

NATIONAL ASSOCIATION ACTIVITIES

Industrial Sand

PLANS ARE RAPIDLY being completed for one of the best conventions ever held by the National Industrial Sand Association. The Greenbrier at White Sulphur Springs, W. Va., nationally famous resort hotel and locale of excellent golfing and other sports, is the hotel, and the dates of the meeting are June 13 and 14. Members are urged to send in their reservations early to secure the best accommodations. The program will include the following speakers: John Gall, general counsel of the National Association of Manufacturers; Dr. H. Reis, technical director, American Foundrymen's Association; Dr. Raymond Hussey of Johns Hopkins University Hospital; Theodore C. Waters, Association Counsel, and members of the Association's executive staff.

Sand and Gravel

STANTON WALKER, director of engineering, National Sand and Gravel Association, in a recent technical information letter has called attention to the increasing use of the Los Angeles Rattler as a measure of the hardness and strength of aggregate particles. He also referred to a comprehensive study of the breakdown of aggregates under road rollers conducted at Purdue University in coöperation with the Indiana State Highway Department.

Ready Mixed Concrete

EXECUTIVE SECRETARY V. P. AHEARN of the National Ready Mixed Concrete Association advises the industry that there has been a further clarification of the Wage and Hour Division ruling with respect to employes of ready mixed concrete companies. According to Interpretive Bulletin No. 5, while a ready mixed concrete company was not covered by the statute simply because cement was brought in from outside the State of concrete production, other employes in the same plant, such as employes purchasing raw materials from other States or handling or unpacking them upon receipt from other States, may be engaged in commerce and therefore entitled to the benefits of the Act.

By a decision of the I. C. C. on May 1, private carriers of property by motor truck will be subject to Federal regulation prescribing qualifications and maximum hours of employment of drivers, and standards of equipment, on and after August 1, 1940. Drivers of transit mix trucks will be affected by this decision in many cases.

Mineral Wool

NATIONAL MINERAL WOOL ASSOCIATION held its centennial celebration and convention at the Chicago Towers Club, Chicago, May 16 with several hundred members and guests in attendance. James Addington, president of the American Rock Wool Co., and president of the association, led the meeting with Jan. S. Irvine presiding as chairman at the technical session.

Speakers of national prominence were on the program, including: Frank B. Rowley, director, Engineering Experiment Station, University of Minnesota, who told about his studies and research on the problem of condensation in which a test house and house models were used; L. V. Teesdale, senior engineer, Forest Products Laboratory, U. S. Department of Agriculture, Madison, Wis., described his tests on various insulation treatments on different panels in a test house; S. Konzo, University of Illinois, showed slides of the test house at Urbana, Ill., in which data was shown covering heat losses before and after insulation was applied; Woodruff H. Purnell, assistant architectural engineer, T. V. A., Knoxville, Tenn., outlined the heating economies resulting from application of insulation to one of the project's community houses which was heated electrically; and F. E. Giesecke, president of the American Society of Heating and Ventilating Engineers and eminent educator, told about the effect of higher interior wall surface temperatures on economy and comfort. Prof. Giesecke gave a very thorough explanation of the various manifestations of heat with relation to comfort in the home.

COMING CONVENTIONS

National Industrial Sand Association, The Greenbrier, White Sulphur Springs, W. Va., June 13 and 14.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

National Cinder Concrete Products Association, Atlantic City, N. J., August 5, 6 and 7.

Lime

THE ANNUAL SAFETY COMPETITION conducted by the Bureau of Mines in coöperation with the National Lime Association has announced the following winners with perfect safety records: National Gypsum Co., York, Penn.; Warner Co., Devault, Penn.; North American Cement Corp., Martinsburg, W. Va.; Marblehead Lime Co., Springfield and Hannibal, Mo.; South Chicago, Quincy, and Thornton, Ill. plants; Lehigh Lime Co., Mitchell, Ind.; Lawrence Portland Cement Co., Thomaston, Maine; Superior Lime & Hydrate Co., Pelham, Ala.; Belle Isle Lime Co., Detroit, Mich.; The Haden Lime Co., Houston, Texas; United States Gypsum Co., Cordova, Ill. The accident-severity rate for all plants in 1939 was 3.5 days of disability per thousand man-hours, compared with 4.3 in 1938.

Crushed Stone

PENNSYLVANIA STONE PRODUCERS ASSOCIATION held its Spring meeting at the Penn-Harris Hotel in Harrisburg, April 17. More than 65 producers attended. Addresses were delivered by A. T. Goldbeck, engineering director of the National Crushed Stone Association on "Cement Factor Based on Strength in Concrete Pavement"; J. R. Boyd, administrative director of the National Crushed Stone Association; C. H. Buckius, assistant to the Pennsylvania Secretary of Highways, who discussed the 1940 highway maintenance and construction program for Pennsylvania; and H. S. Mattimore, chief engineer of tests for the Department, who discussed a minor change in 2B size coarse aggregate. Mr. Goldbeck discussed soundness tests for aggregates and the effect of glassy particles. He also brought out the fact that highway engineers measure the value of concrete road slab by its ability to withstand high transverse or bending stressed produced by traffic or natural causes, and also by the high compression during times of expansion occasioned by hot weather and moist conditions.

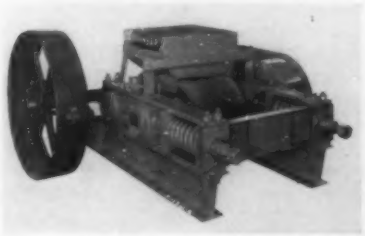
NEW MACHINERY * NEW EQUIPMENT

Roll Crusher With Manganese Shell

THE PIONEER ENGINEERING WORKS, Minneapolis, Minn., has recently added a roll crusher to its line. The crusher has rolls 16 in. in diameter, with a 16-in. face, which gives the Pioneer company a complete range of sizes from 16 in. up to 54 in. in diameter.

The 16-in. roll crusher is offered with either bronze bearings or Timken bearings. One of the important features of the bronze bearing crusher is that the bearings are enclosed and protected from dust, just like the anti-friction bearings.

It is equipped with fine corrugated rolls which will produce small materials, but still have a large "bite." The shells are manganese steel, and



Roll crusher with fine corrugated rolls to produce fine materials

replaceable. The crusher is gear-driven, and all gears are located on one side of the crusher, and fully enclosed.

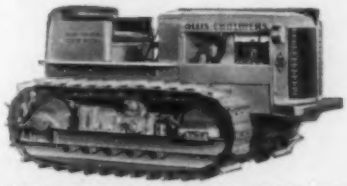
Convertible Motor Crane

THEW SHOVEL CO., Lorain, Ohio, announces a full revolving crane, convertible to shovel, dragline, clamshell or backdigger, mounted on a 10-wheel, rubber-tired mounting. The "Moto-Crane," as it is called, offers a complete, integral unit of crane and mounting, the mounting being a crane carrier designed especially for this purpose. Some of its features are: three axle mounting supported on 10 rubber tires, both tandem rear axles drive; 175-in. wheelbase for better maneuvering; ten speeds forward and two reverse; the unit will climb a 40 percent grade on dry smooth roads or trails; space for groundman, tackle and rigging; and rocker arm rear end in place of springs, giving flexibility for travel and rigidity for operation.

The turntable is built to balanced center drive design, employing the patented sloping machinery frame. Power is delivered from the motor to the center drive pinion by means of a roller chain power take-off. The center drive pinion in turn powers directly the hoist and swing shafts. Moto-Cranes are built in five models, ranging from units in which minimum total weight is the main objective up to big-capacity, heavy-duty units that will carry 100-ft. or longer booms.

Two-Cycle Diesel Engine In Crawler Tractor

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis., has introduced a Diesel crawler tractor, the HD10,



Diesel-powered tractor equipped with constant-mesh gears

as a companion model to the HD14. The HD10 has a General Motors 2-cycle Diesel engine with Velve-touch bi-metallic steering clutches and brakes.

The four-cylinder engine provides 86 belt hp., and 79.0 drawbar hp., with drawbar pulls up to 18,430 lb. The tractor is available in two tread widths, 62 and 74-in., with the narrow model weighing 19,900 lb., and the wide model weighing 20,700 lb.

Constant-mesh gears permit shifting on the go like a truck with six speeds forward and two reverse. Because the engine can be throttled down to almost half engine speed without losing drawbar pull, a speed range is provided from 1.58 to 6.03 m.p.h.

Recorder Developed for Cement Kilns

GENERAL ELECTRIC CO., Schenectady, N. Y., has developed a duplex recorder for recording simultaneously kilowatts and rkva, kilowatts and frequency, or volts and amperes. Designed originally for cement mills to record kiln speed and temperature simultaneously on a single chart, the improved instrument may be had with any two of the elements formerly available singly in the type CD instruments. It is expected to have a wide use wherever it is desirable to obtain synchronism between two separate records, or where space economy makes it necessary to place two separate recording mechanisms in a single case.

Two separate instruments placed side by side in one case, recording on a single chart

It comprises essentially two separate type CD instruments placed side by side in one case and arranged to record on a single chart. Timed by a high-torque Telechron motor, or an 8-day spring clock, the chart carriage feeds the paper at 1, 2, or 3-in. per hr.

Motor crane convertible to shovel, dragline, clamshell or backdigger, mounted on a specially designed carrier

NEW MACHINERY

Sixty-ton Crawler Crane

LIMA LOCOMOTIVE WORKS, INC., Lima, Ohio, has added to its line a 60-ton heavy-duty crawler crane. This unit makes its current line of cranes range in capacities from 13 to 60 tons.

The 60-ton crane has four drums, including a worm driven boom hoist, and has vacuum-controlled independent clutches for hoist, travel, swing and boom up or down simultaneously. Drums are of large diameter with a wide face to effect greater cable

Heavy-duty crane has four drums and independent clutches

economy. Main machinery is arranged so that a proper balance is provided for handling long booms at low angles.

Motor Oil for Heavy-Duty

THE TEXAS CO., New York, N. Y., is offering a new motor oil designed especially to overcome certain difficulties encountered in the lubrication of automotive Diesel and gasoline engines in heavy-duty service. Known as Texaco 303 motor oil, it is said to have made an outstanding record in a number of the country's prominent bus and truck fleets and to have eliminated the major difficulties experienced with these heavy-duty modern engines in the clogging of filters, screens, and oil lines.

Increase Holding Power of Wire Rope Clip

THOMAS LAUGHLIN CO., Portland, Maine, subjected a recently developed wire rope clip to laboratory tests which indicated that it had an increase in holding power from 20 to 30 percent and a marked lessening of rope distortion.

Although this wire rope clip does not materially modify the fundamentals of clip design, the improved performance is attributed to the fact that the bolts and identical bearing surfaces on opposite sides equalize the pressure on the rope. The improved clip differs from the U-bolt clip which has both nuts and a single flat bearing surface saddle on one side. Care must be exercised in placing the saddle of the U-bolt against the working part of the rope.

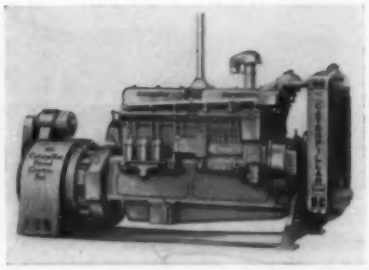
Easily applied wire rope clip

Large Self-Contained Diesel-Electric Set

CATERPILLAR TRACTOR CO., Peoria, Ill., has added a 66-kw. and a 52-kw. unit to its line of Diesel-electric sets. Both are powered by 6 cyl., heavy-duty Diesel engines. The bore and stroke of the 66-kw. unit is 5⅜- x 8-in., and in the 52-kw. unit it is 5¼- x 8-in. Governed speed of both engines is 900 r.p.m.

The Diesel engines are started by an independent, 2 cyl. vertical 4 cycle, 24 hp. gasoline engine driven through a disc clutch and helical gears to flywheel. A 32-volt electric starter also is available.

The generator is of the rotating field type, direct-connected. When three-phase alternating current is desired, the following voltages are obtainable: 110, 220, or 440 volts; with a four-wire hook-up, 120/208 volts are obtained. For single phase



Diesel-electric set now obtainable in 52-kw. and 66-kw. sizes

current, 110, 220 or 440 volts are obtainable.

Four-Wheel Scrapers Of Simple Design

BUCYRUS-ERIE CO., South Milwaukee, Wis., has introduced a new line of four-wheel scrapers, in a complete range of sizes matched to the new line of International TracTracTors.

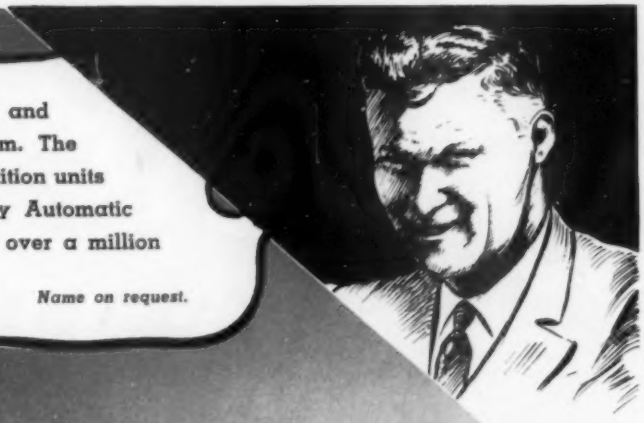
Using two-line cable control, one to control height of digging edge and the other to control the opening of the apron and tilting of the bowl, these scrapers are claimed to give accurate depth of both digging and spread. In dumping, the bowl is tilted upward through an arc between the side-plates of the frame to an almost vertical position, giving positive, controlled, rolling ejection. The tilting bowl consists of a simple reinforced double-bottom plate curved below and behind the dirt, and rotating between the fixed side-plates of the frame. The front edge of the tilting bowl is hinged to the frame, just behind the digging blade, by means of a full-length solid bar. As it rotates about this hinge in dumping, the bottom of the bowl lifts, thus ejecting the dirt with a rolling motion. By this means, ejection is aided by gravity.

For easy loading, the cutting edge holds the same efficient angle at all times while digging, and, because a practically constant wheelbase is maintained throughout the cycle, there is always uniform straight line pull from tractor drawbar to the cutting edge.

Four-wheel scraper has features designed for easy loading and smooth dumping with a rolling motion of the tilting bowl

CONCRETE PRODUCTS AND CEMENT PRODUCTS

Attractive Design With Two Sizes



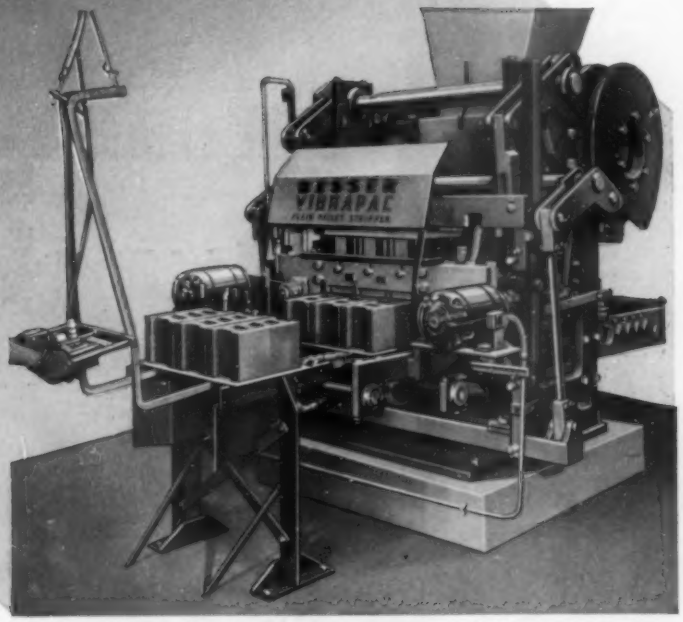
"We had demand for bigger production and a Besser Vibrapac has solved the problem. The Vibrapac is turning out 1500—4 x 8 x 12 partition units an hour. Our four year old Besser Victory Automatic tamper is still producing as usual. It made over a million units last year.

Name on request.

Undirectional vibration (Flam patents) as employed in the Besser Vibrapac Plain Pallet Stripper was used to make the first vibrated concrete blocks ever made and sold under production. Undirectional vibration is combined with the original Besser Plain Pallet principle in the Vibrapac.

VIBRATORS

TAMPERS



Besser Super Vibrapac Plain Pallet Stripper with Automatic Pallet Feeding and Electric Offbearing Hoist.

Besser Super Fully Automatic Plain Pallet Stripper with Mixer, Skip Loader, Automatic Pallet Feeder and Automatic Front Conveyor.

BESSER PLAIN PALLET STRIPPERS

BESSER TAMPER STRIPPERS

Besser Super Automatic Plain Pallet Stripper	Daily Capacity 3000 to 4000
Besser Victory Automatic Plain Pallet Stripper	Daily Capacity 2000 to 2500
Besser Semi-Automatic Plain Pallet Stripper	Daily Capacity 1200 to 1500
Besser Champion Power Operated Plain Pallet Stripper	Daily Capacity 1000 to 1200
Besser Multi-Mold Hand Operated Plain Pallet Stripper	Daily Capacity 250 to 350

BESSER VIBRAPAC PLAIN PALLET STRIPPERS

Besser Automatic Vibrapac Plain Pallet Stripper	Daily Capacity 4500
Besser Automatic Victory Vibrapac Plain Pallet Stripper	Daily Capacity 2000
Besser Master Vibrapac Hand Operated Plain Pallet Stripper	Daily Capacity 800

BESSER MANUFACTURING COMPANY

COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS

Complete Sales and Service on BESSER, ANCHOR, CONSOLIDATED, IDEAL, HOBBS, UNIVERSAL, PORTLAND

206 40TH STREET **ALPENA, MICHIGAN**

THE SAVING IN PALLET COST WILL PAY FOR A BESSER PLAIN PALLET STRIPPER

Low and High Pressure Curing

Minimum stock of pallets required by using combination of low pressure and high pressure steam curing

COMPARATIVELY few concrete products plants have been designed to meet the needs of the future. Geo. W. McDearmon of Baton Rouge, La., has built a concrete products plant which is not only modern in meeting the requirements in the South, but he had the vision to design his buildings and their location so that additions may be made at relatively low cost. In fact, some of these additions to plant are already projected for construction this year.

Concrete block manufacturing plant to the left, showing low-pressure curing rooms, and to the right, high-pressure curing cylinder and oil-fired boiler

As shown in the illustrations, it will be noticed that the present building is open at the sides and ends, and is built with structural steel supporting columns and steel roof trusses in such a manner that there are no obstructions in the entire concrete floor area. The building is unique in that it was designed by Mr. McDearmon and constructed with plant forces, and is welded throughout. The steel columns were made up by the plant welder, using two 8-in. I-beams welded together to provide an unusually strong column from which the roof trusses are supported. Roof trusses, however, were made to Mr. McDearmon's design but in an outside plant. These trusses had steel angle lugs welded on the upper member to permit the roof purlins to be bolted securely to the trusses.

The building is about 20 ft. high at the sides, 32 ft. at the center, 53 ft. wide and 120 ft. long. Ample clearance is available for the skip hoist from the 28-cu. ft. mixer into the hopper of the No. 7 Stearns Joltcrete block machine. Six floodlight lamps suspended from the roof trusses provide good illumination for night work.

At one end of the building is the Stearns Joltcrete machine with a capacity of 2350 standard 8- x 8- x 16-in. block per 8-hr. day. Cement and aggregates are received in carload lots on a railroad switch track which parallels the end of the building.

Special trucks and racks were made by the welder to reduce back-breaking labor and assure efficient handling of aggregates, cement, pallets, and mold box attachments. These convenient handling units may be seen in one of the illustrations.

Sacked cement is loaded out of box cars into a special rack. Holding 72 sacks, it is made of welded angle iron sections with boards bolted to upright members at each end. It has steel legs which permit sliding a Barrett lift truck underneath the floor of the rack to move it into convenient position near the concrete mixer serving the block machine. Another similar rack was made to hold 3200 lb. of pallets.

It is a simple job to make mold box changes, as a special rack was made for this purpose. As shown in the illustration, the rear end of this rack is elevated above the other section so that on the lift truck it may be conveniently pushed into position on the Stearns block machine with a minimum of lifting. The forward platform of this rack holds the accessory mold attachments.

Vibrating type concrete block machine with pallet cleaner and oiler alongside

Another interesting piece of equipment assembled by the welder is a batch buggy of 27 cu. ft. capacity, having two pneumatic-tired wheels to carry the load and a small rubber-tired guide wheel.

Very little effort is required to move the batch buggy with 27 cu. ft. of aggregates over the concrete floor into position to dump into the 28-cu. ft. mixer. Sacked cement on the rack is within convenient reach of the man operating the mixer, and water has been piped near the machine. Only one off-bearer operator is required to handle block from the machine to the convenient welded steel racks, also made by the welder. The off-bearer is assisted, however, by the operator of the ferris-wheel type pallet oiler and cleaner set up near the block machine.

Loaded racks of "green" block are rolled into the low-pressure steam curing rooms with the lift truck. Each room, constructed of concrete blocks, holds four racks or 200 blocks. The rooms, which are located on the floor of the plant building, have a capacity for 24 racks. Blocks are subjected to

All-steel, welded structure, except roof, houses concrete block plant. Note low-pressure steam rooms made of block, to the right

Left to right: Pallet rack, cement bag rack, lift truck supporting mold box changing rack, and to the extreme right, 27-cu. ft. batch buggy

Cast concrete foundation pedestals are one of the side-lines

Vibrator operated by electric motor for casting joists and beams. Note special welded car which is used in running joist forms over vibrated section of track

low pressure steam curing, about 7 p.s.i., for 5 hr. The intermediate low pressure curing reduces the number of pallets required, as the units can be handled without pallets after this curing period.

The blocks are then ready to be moved by small rail trucks into the high pressure steam curing cylinder, where they are kept for 8 hr. under a steam pressure of 100 p.s.i. An 80-hp., oil-fired boiler provides the steam.

Lightweight aggregates for concrete block comprise two sizes of Superock, about ½ in. down to ¼ in. for coarse, and ¼ in. down to dust for fine aggregate. Cement and aggregate batches consist of a 1 to 7 ratio combined in a dry rodded mix. About 32 lb. of finely ground silica per bag of standard cement is used which, when subjected to high pressure steam, reacts chemically to use up all of the cement making the blocks much stronger. All sizes of block commonly used are made in addition to the standard size 8 x 8 x 16 in. Sand and gravel block are also made for foundations and to meet competition.

Make Joists, Beams, Piers and Burial Vaults

In addition to concrete block, Mr. McDearmon makes reinforced concrete joists in 8- and 10-in. depths of standard P.C.A. design and also special sizes on order. Another product is a concrete beam which is designed and reinforced to architect's and contractor's specifications. High early strength cement is used for these products. Concrete batches comprise 10 percent natural sand with Superock in the following proportions: 3 parts fine and ½ part coarse Superock, ½ part sand, and 1 part cement.

Joists and beams are poured in molds supported on a narrow gage rail car and run over a slack section of track under which is a vibrator operated by a 1 hp. variable speed motor. In the illustration may be seen two reinforced concrete beams being rolled into place over the vibrating section of track.

Mr. McDearmon has the Louisiana state licensee rights to manufacture the Ledyard concrete vault, patents for which are held by the Ashland Vault Co., Ashland, Ohio. High early strength cement and a well-graded sand in a 1:3 mix is used in casting the vaults in steel molds. Two methods of vibrating the vault molds are used simultaneously; the electric-jolt track vibrator, previously mentioned, and an air vibrator bolted to the inner form.

Left: Three-compartment, 110-ton capacity Blaw-Knox batching plant operated by Wheeler & Putnam, Ashland, Ky. Right: Batching plant of Roanoke Ready Mixed Concrete Co., Roanoke, Va.

Reaching Ready Mix Markets

Both large and small cities offer a market for ready mixed concrete; but the sales problems are different

FIFTEEN YEARS AGO there were only 25 relatively small producers of ready mixed concrete; today there are nearly 700. In 1929, it is estimated that the production totaled 1,500,000 cu. yd.; last year this figure had jumped to over 10,000,000 cu. yd.

Ready mixed concrete is not solely a large-city industry, as plants are found in towns of 10,000 population and others ranging in population size up to our largest metropolitan centers. The economic limit is not so much controlled by population of the city in which the plant operates as it is by the character of industry and the economic status of the surrounding territory.

There is a tendency in the smaller city, and to a certain extent in the larger metropolitan areas, to reach out too far in making deliveries of ready mixed concrete without a sufficiently compensating price for the additional cost. Smart operators are doing everything possible to reduce the average haul. One large operator has cut down his average haul to 3.6 miles.

Some operators have found it economical, where the job is large enough to warrant the expenditure, to install a transfer plant or semi-portable batching plant. It is cheaper to haul aggregates in large capacity trucks or by rail to the semi-portable batching plant and use the mixer trucks only for the short haul to the job site. Special bulk cement trucks also are used for this purpose.

In some cases the sand and gravel plant operator has set up a batching plant, and the only investment the ready mixed concrete operator has is in his mixer trucks. This arrangement is particularly advantageous for the smaller ready mixed producer who does not have a sufficient volume of business or is faced with very irregular demands in which a batching plant to meet peak deliveries would not be warranted.

Sacked cement is transferred from warehouse to charging floor of General Materials Co., Inc., St. Petersburg, Fla., by elevating conveyor

Pricing zones based on length of hauls and a schedule of prices covering quantities are essential to any successful ready mixed concrete producer. These are just a few fundamentals involved in the business as it would be impossible within the scope of a single article to cover this subject. Some typical examples of different types of ready mixed concrete operations and the equipment used are given below:

Owensboro, Ky., Plant Has Combination Garage

In Owensboro, Ky., a city of about 25,000 population, the Transit-Mix Concrete Co. built a new plant and started the first deliveries of ready-mixed concrete in August, 1938. The plant consists of a 110-ton, two-compartment Blaw-Knox bin, a Blaw-Knox batcher, storage facilities for sacked cement and heating equipment for heating the mixing water during freezing temperatures.

Aggregates are trucked to the plant from a local producer of sand and

Central mixing plant of General Materials Co., Inc., St. Petersburg, Fla.

gravel, dumped into a hopper and are elevated to the bins by a Telsmith belt bucket elevator. The plant is next to a railroad siding and receives cement in sacks in carload lots. Cement is handled into the warehouse over a Barber-Greene belt conveyor. The conveyor travels up a stiff incline and is equipped with steel cleats, or spacers, between which the sacks are placed.

Deliveries are being made in two 1½-cu. yd. Blaw-Knox truck mixers on G.M.C. trucks, but the plant batching equipment has sufficient capacity for later additions of delivery equipment.

City water is available by a turn of a valve for mixing water and the plant is equipped for heating the water during sub-freezing temperatures. A hose fitting is then connected to an Aeroil double-coil water heater and the water is heated to 150 to 180 deg. and discharged into an open top steel tank of 400 to 500-gal. capacity on the mixing floor. For ordinary winter operating conditions the heated water will remain sufficiently warm for about 30 minutes when handled in this way.

The illustration of the plant shows how garage facilities for the mixer trucks have been provided at little cost.

G. W. Robinson, J. C. Gregory, and W. H. Robinson, partners in the company, were formerly paving contractors.

Roanoke Plant a Pioneer

Roanoke Ready-Mixed Concrete Corp., Roanoke, Va., is the pioneer ready-mix producer in this city of 69,000 people.

All aggregates are delivered to the site by rail, and unloaded from cars to bin or ground storage by crane and clamshell bucket. The overhead storage bin has a capacity of 110 tons, divided into three equal compartments. The weighing batcher for the aggregates is of the 1½-cu. yd. size for three materials; it is the round-nose type, which permits the aggregates to be charged directly into the truck mixers without the use of a funnel or a confining hopper.

Open top agitator truck delivers concrete to the job, General Materials Co., St. Petersburg, Fla. A Koehring mixer is shown on platform above with a Concrete Transport mixer truck below

This plant is equipped to deliver heated concrete. A 500-gal. water tank is heated by coils from a 30-hp. boiler. Steam lines have also been run to each of the bin compartments to overcome freezing of moisture in the aggregates.

The Roanoke company operates a total of six mixers, four of which are mounted on International trucks, and two on Dodge trucks.

From Crushed Stone to Ready Mixed Concrete

Down in sunny St. Petersburg, Fla., a winter resort city of 40,000 population, ready-mixed concrete has taken quite a foothold. It was first introduced in 1938 by the General Material Co., a new concern under the direction of Richard Hinke, vice-president. Mr. Hinke had come to St. Petersburg from St. Louis, where he had for years managed a large crushed stone company.

At the start the company had a transmit mix batching plant and three transit mixer trucks. Later the plant was changed over to a central mixing plant with five truck mixers and a short while later two additional truck mixers were added, making seven in all.

The plant is equipped with a 1 cu. yd. Koehring mixer and, with truck mixers of 1½ and 2 cu. yd. capacity, has put out as much as 240 cu. yd. of concrete a day. The trucks are Fords and Chevrolets, and the mixers are manufactured by the Concrete Transport Mixer Co., St. Louis, Mo. They are the open top type with internal revolving mixing blades and are used as agitators now that the plant is producing a shrink-mix concrete.

The batching plant consists of a 3-compartment Blaw-Knox 125 ton, steel bin and a 1 cu. yd. batcher with 3-beam scale. The plant is not very close to producing areas for acceptable aggregates so they are brought in by rail to a siding next to the plant. Crushed stone is shipped from Brooksville, Fla., and sand from Lake Wales, Fla. These are discharged into

One of the latest type mixer trucks operated by Transit-Mix Concrete Co., Owensboro, Ky. A Barber-Greene cement conveyor is shown to the right

a truck hopper and placed into the bins by a bucket elevator, 127-ft. centers. Sacked cement is shipped to the plant in box cars and stocked in a cement warehouse adjoining the main plant. As needed, the cement sacks are elevated to the batching floor by the Link-Belt cleated belt elevator shown in one of the illustrations. It takes about three minutes to dispatch a 2 cu. yd. batch of concrete.

The company also operates a small plant at Bay Pines on the outskirts of St. Petersburg, established there to furnish the concrete for a large hospital expansion program. Roger Smith is president of General Material Co. and Mr. Hinke, vice-president, is manager of all ready-mixed concrete activities.

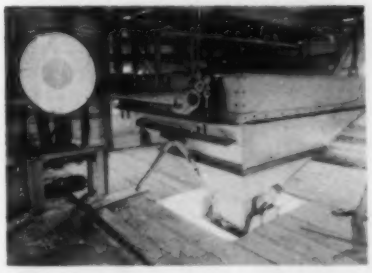
New storage and dock facilities of the West Penn Sand and Gravel Co., Pittsburgh, Penn., for handling sand and gravel from towboat, "The Flavia" to open storage or to the ready mixed concrete batching bins to the right

Building Supply Dealer Goes Into Ready Mix Business

The Wheeler and Putnam Co., of Ashland, Ky. (a city of 29,000 population), has been operating a building supply business for many years. Aggregates are delivered to the yard by barge, and the material is then unloaded by a conveyor system into bulk bins located at the south end of the yard.

The truck mixer loading plant, shown in the illustration, was installed near a railroad siding. Bag cement is transported from cars to the elevated cement house, seen on the right in the illustration, by means of an inclined belt conveyor. The floor of the cement house is on the same level as the operating platform of the truck mixer charging plant, and cement is emptied into a hopper depressed in the floor of the cement house. This hopper holds a sufficient number of sacks of cement for the batch, and the cement is loaded from it into the mixer.

As additional aggregates are required at the ready-mix plant, they are taken from the bulk storage bins in trucks and delivered to pits located near the mixer loading plant. The material is then picked up by a crane with clamshell bucket and transferred into the overhead bin of the charging plant.



Aggregates for ready mixed concrete weighed out in Heltxel batching equipment with Kron scale, West Penn Sand & Gravel Co., Pittsburgh, Penn.

The Wheeler and Putnam Co. has three Blaw-Knox 1½-cu. yd. truck mixers, all mounted on Reo chassis.

In addition to the city market, the adjacent towns of Catlettsburg (Ky.) and Ironton (across the river in Ohio) with another 22,000 people, and several smaller communities, can be served economically with ready-mixed concrete from the Ashland plant.

Long conveyor to handle aggregates to plant of Ready-Mixed Concrete Co., Chattanooga, Tenn. Note unusual shape of structure. In the foreground is one of the Rex mixer trucks and Johnson batching equipment is used

Pittsburgh Gravel Producer Enters Ready-Mix Field

Ready-mixed concrete has been added to the already large production in the Pittsburgh area by the West Penn Sand and Gravel Co., Pittsburgh, Penn., with the construction of new material handling facilities and the erection of batching equipment on the Allegheny River at McCandless Avenue. The company also is engaged in contracting and has been a producer of sand and gravel since 1926.

Until May, 1938, aggregates were shipped entirely by rail from a distribution point near Rochester, 40 miles below Pittsburgh. This shipping point is located on the Ohio River where the company operates a ladder dredge, having a capacity of 1500 tons of washed sand and gravel in 12 hours.

The new terminus consists of unloading facilities and concrete storage bins for stockpiling aggregates received by barge, two identical batching plants equipped for winter operation, an independent cement batcher and a fleet of ready-mixed concrete trucks.

Barges carrying aggregates are towed by the "Flavia," powered by a 200-hp. Diesel engine. A Whiley-Whirley steam-powered crane with a 3 cu. yd. clamshell bucket unloads either into the batching bins direct or into the concrete bins to be reclaimed later with the same machine.

Storage capacity, in open bins, is 8000 tons in plaster sand, concrete sand and four grades of gravel. The batching bins are three-compartment, 300-ton capacity Heltzel steel bins, each of which is discharged into a

"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.

G. M. Friel, Mgr. Columbus, O.

3 cu. yd. Heltzel "Agrabatcher" for batching aggregates for truck deliveries or into ready-mixed concrete trucks. Kron scales weigh out the loads.

The bins, including the batching floor, are totally enclosed by wood siding for winter heating, live steam being introduced into the bins and batchers when the weather is below freezing. The open tops of the bins are covered by tarpaulins.

The cement batcher (Blawnox) is an independent plant of 500-bbl. capacity in two compartments, and the cement, for ready-mixed concrete, is weighed. Cement is received by rail in sacks which are emptied into a short screw conveyor feeding into the bucket elevator that fills the bins. The concrete storage bins are also fitted with steam pipes so that the material is hot before it reaches the Heltzel steel bins.

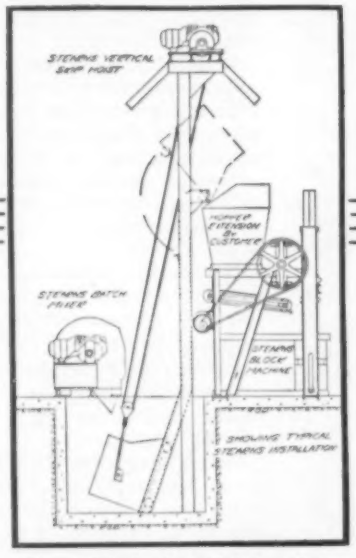
Concrete is delivered in two 2½ cu. yd. Blaw-Knox transit mixers and three Jaeger mixers (2½- and 1½-cu. yd.) all mounted on Autocar trucks. A ready-mixed truck (2½ cu. yd.) can be loaded and on its way in less than 1½ minutes.

Mike Mannella is president of the company and Raymond Mannella is secretary-treasurer.

Ready Mixed Concrete Bids Opened in Chicago

FOLLOWING on the heels of a Federal investigation, the City of Chicago recently advertised for and received bids involving 3990 cu. yd. of ready mixed concrete. Commissioner of Public Works O. E. Hewitt said that a trial of the new method would be conducted with the object of comparing its cost with the old method of mixing concrete by day labor on each job. To the objection that the use of ready mixed concrete will reduce the number of those employed on paving jobs, Commissioner Hewitt pointed out that more men eventually would receive employment because the savings will permit more paving work to be done. Eleven contractors asked for specifications but only two made bids. These were the Material Service Co. and Construction Aggregates Co., Chicago.

The bid of Material Service Corp., which was low, amounted to $5.54 per cu. yd., for the Indianapolis project, and $5.84 each for Division Street and Laramie Avenue projects. Construction Aggregates Co.'s bids for the same projects were $7.60 and $7.45, respectively. The hauls for the low bidder are 9 min., 24 min., and 22 min., respectively.



Stearns Skip Loader with independent motor drive.

STEARNS Skip Loader

Speeds production of concrete units by rapid transfer of concrete from mixer to block machine hopper or of aggregate from floor to elevated mixer. Operations governed by push-button control. Track may be vertical as shown at left or at any desired angle.

Write for folder suggesting a number of possible installations.

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

Manufacturers of the famous STEARNS JOLTCRETE Machines, power and hand operated strippers, down-face block machines, brick machines, manhole block machines

Big Concrete Pipe

MANUFACTURE of large diameter concrete pipe on a production basis sometimes involves a problem which is not encountered with the smaller pipe sizes generally handled conveniently by means of the customary buggies.

Unless a large traveling overhead crane or mechanized equipment is available, the manufacturer must resort to some cumbersome substitute. The Nelsen Concrete Culvert Co., East St. Louis, Ill., solved the problem, however, at a minimum expense. The illustration shows the production line and equipment set up ready for operation.

A timber platform approximately 8 ft. wide and 100 ft. long was constructed on top of and supported by concrete pipe set on end. Paralleling the platform on each side, small T rails were laid on the ground over a stringer tie about 8 ft. from the platform. Spanning the platform is a U-shaped steel frame mounted on two small roller-bearing equipped flanged steel wheels on each side for operation over the track, which extends out a distance of about 175 ft.

Suspended from the steel frame and movable from side to side is a 3-ton Yale & Towne hoist, making it to all intents and purposes a traveling crane designed for handling the pipe and forms. The 72- and 60-in. diameter concrete pipe and forms handled by the hoist weigh up to 4½ ton, and may easily be moved into position on either side of the platform. Pipe are made in 5-ft. lengths.

At the extreme end of the platform within easy reach of stockpiles of aggregates is mounted a new Model 10-S, Marsh-Capron concrete mixer having a capacity of 10-cu. ft. Aggregates and cement are loaded into the mixer skip which extends over the end of the platform. Water has been piped along the side of the platform, and a steam line also was laid for cold weather operation. For the large pipe crushed stone graded from 1½-in. down to ¼-in. is used.

Concrete is moved down the platform in buggies and is chuted into Quinn steel pipe forms which have been moved into position by the hoist. The forms are built with steel projections to permit the application of vibration most efficiently by means of a Syntron vibrator.

With this production system, the Nelsen Concrete Culvert Co. could make pipe on both sides of the platform almost continuously if the demand warranted it.

Another product which will be made at the end of the pipe production line is concrete roadway curbing. Extending beyond the platform is an area about 75 ft. long between the rails in which the curbing will be poured in steel forms. The traveling hoist will be available to handle the curbing forms very conveniently.

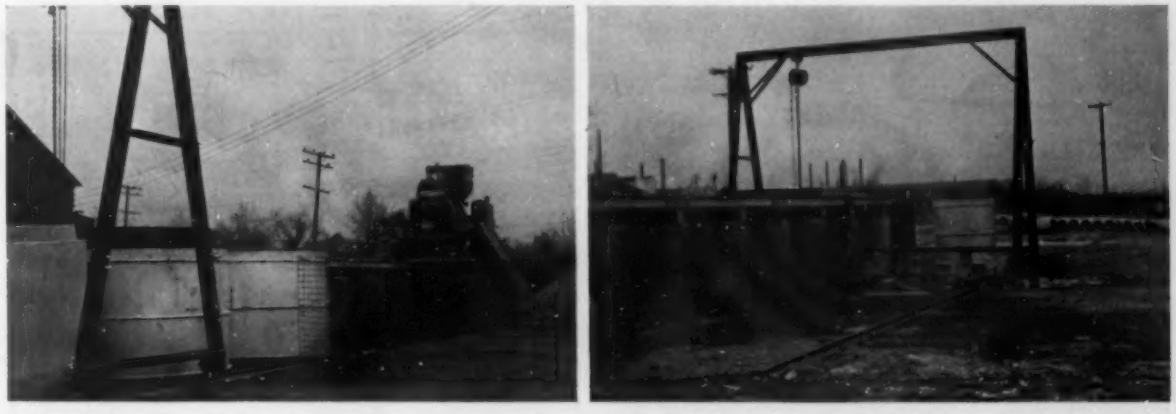
At some future date, it may be desired to extend the platform for pipe manufacture and this 75 ft. will be used for this purpose. In fact, the only limitation to the extension of the trackage and platform is the boundary of the company's property line.

Burial Vault Convention Well Attended

WITH AN ATTENDANCE on the second day of nearly 80 percent greater than ever before, the National Concrete Burial Vault Association convention at Cincinnati, Ohio, May 7 and 8 was generally considered one of the best ever held. No small measure of the success of the convention may be attributed to the exhibits in the Netherlands Plaza Hotel, and the practical nature of the program.

Officers elected included: President, Frank L. Mathies, New Haven, Conn.; vice-president, G. H. Blackstone, Zanesville, Ohio; secretary and treasurer, Ralph W. Mead, Cleveland, Ohio; directors, Lowell K. Huber, Cincinnati, Ohio and Huber J. McQuestion, Milwaukee, Wis. Past presidents introduced were H. A. Dahlquist, Ross P. Hilles, Harold E. Coburn, and President Hamilton paid tribute to the late Harry Ledyard, the first president, and mentioned absent past presidents, Geo. M. Painter and L. A. Chick.

Following a roundtable luncheon and the election of officers, Chairman Dahlquist presented the report of the Specifications Committee in which the wide divergence of requirements for water-proof concrete burial vaults was pointed out, and also the need for further coöperative work between the association and the Portland Cement Association and the American Concrete Institute. Chairman Washburn presented the report of the Wage and Hour Committee. Other reports were received from B. T. Elmore, Credit and Collections Committee; A. M. Lendrum, Membership Committee; and W. W. Haase, National Advertising Committee. Following an address by P. N. Rothe, general manager of *Casket* and *Sunnyside*, on the value of coöperative advertising, the members



Left: Concrete pipe serve as a platform support for the mixer. Right: Travelling crane for handling pipe and pipe molds

voted to incorporate payment for the national advertising campaign in the dues. However, as this will not become effective until January 1, 1941, it will still be necessary to receive voluntary pledges.

C. R. Runyan, cemetery superintendent, told about the sunken grave problem, and mentioned that many cemetery managements are now requiring the use of a burial receptacle designed for permanency. Following this address, the convention adjourned for a tour of the exhibits before the luncheon roundtable conferences.

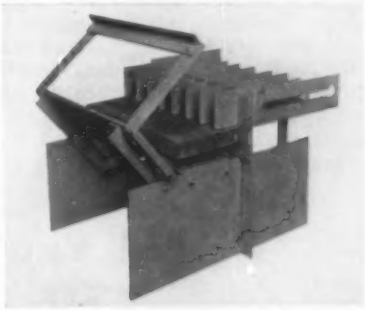
In the afternoon buses took members to the Huber-Baxter factory where Paul Woodworth, engineer of the Cement Products Bureau, P.C.A., gave a demonstration of the proper water - cement - ratio for workable concrete to be placed in burial vault molds. Later in the afternoon, the members were guests of the Van Meter factory where refreshments were served. The beverages were in an Ashland vault filled with ice, and an Ashland lowering device was used as a tea wagon.

Harry J. Gilligan, secretary of the National Funeral Directors' Association, spoke on "Some National Problems" Thursday morning, pointing out the necessity for organized public relations work. After Mr. Gilligan's address, Paul Woodworth gave an analysis of the demonstrations made at the factories the day before.

At the close of the session, it was voted that Chicago be the next convention location in 1941.

Small Brick Machine

R. F. Reed Co., Three Rivers, Mich., is marketing a small concrete brick machine which is said to offer several



Hand-operated brick machine has a capacity of 3000 brick per day

advantages. The mold box is designed to make seven bricks on edge on plain wood or steel pallets. A simple system of levers open or close the mold box in one operation. The operation which opens the machine also trowels the sides of the brick as it draws the dividing blades through the backplate of the mold and out of the way.

Brick ends are molded against the front plate and the back plate, to assure smooth surfaces. The face edge or top side of the brick is struck off with a wood float leaving a distinctive texture. Average daily output of 2¼- x 3¾- x 8-in. brick is about 3000. The machine occupies 20- x 32-in. floor space and is 18¾-in. high.

Trade-Marked Blocks

Currier Lumber Co., Detroit, Mich., stamps all concrete blocks which it manufactures with its trade-mark. This is done in the manufacturing process. Two Besser K3, fully-automatic plain pallet strippers, each with a rated capacity of 6½ blocks per minute, give the plant a daily capacity of 15,000 standard 8- x 8- x 16-in. block with both machines operating in two shifts of 9½ hr. each.

Roseau Concrete Products Co., Roseau, Minn., operated by Howard Skyberg and Lawrence Backman, are building a 12- x 20- x 30-ft. addition to its plant near this city to be used as a steam curing room. Concrete blocks will be used for the addition.

COMMERCIAL PRESTEEL

Recommended by block machinery companies.
Proved by block manufacturers.

BETTER BLOCKS AT LOWER COST
Core openings permit free circulation of atmosphere, assuring uniform, faster curing.

NO PALLET BREAKAGE
Cored Steel Pallets are unbreakable. If bent by accident can be easily straightened.

NO DEAD WEIGHT
One-half the weight of cast iron pallets, one-fifth the weight of plain steel pallets.

LESS STORAGE SPACE
1000 Cored Steel Pallets require space only 2¼ ft. x 5¼ ft. Embossed ribs make stacking easy and firm.

No wonder experts insist on COMMERCIAL PRESTEEL "CLOSE CLEARANCE" PALLETS.

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Just Think What This Means in Dollars and cents saved in handling and upkeep as well as the cost of the pallets themselves.

Investigate today the most efficient and up to date concrete brick making equipment on the market.

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In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

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Ohio Ready Mix Group Discuss Basis for Bids

OHIO READY MIXED CONCRETE ASSOCIATION held its annual meeting at Cleveland, Ohio, May 23 to elect officers and to discuss general business matters. C. E. Ehle, Cleveland, Ohio, was reëlected president and Stephen Stepanian, Columbus, Ohio, was reëlected treasurer. R. O. Davies, Mansfield, Ohio, is the new vice-president.

Most of the discussion was on matters brought up by Secretary Claude L. Clark in his annual progress report. Following some discussion on a proposal to consider a basis for a general bid whereby the highway department would be enabled to make purchases of ready-mixed concrete when needed for maintenance work, it was decided that the members preferred to have such bids made upon a zone basis. If the plan is accepted by the highway department, prices will be based on whether the yardage is above or below 20-cu. yd. of concrete and on hauling zones from 0 to 3 miles, 3 to 6 miles, etc., using 3-mile intervals up to a distance of 30 miles. The only other variable will be the grades of concrete based on strength and type of cement specified other than standard, which would be fixed on a definite price scale, in each case, for each zone.

Mr. Clark, in discussing promotion, told of some of the activities undertaken by ready-mixed concrete producers in Columbus. This group recently had been host to Columbus Builders Exchange members and entertained some 250 guests. A prominent representative of a cement company talked on portland cement concrete and members put on a skit, "Trials of a Concrete Order Clerk," which was similar to that presented at the last convention of the National Ready Mixed Concrete Association.

The Columbus group, has gotten up for distribution a number of handy 6-in. pocket rules that have printed on them much valuable information on ready-mixed concrete such as standard specifications, strengths, mixes, bags of cement per cu. yd., etc.

V. P. AHEARN, executive secretary of the National Ready Mixed Concrete Association had been invited to attend the meeting, but was unable to come because of Washington business. Mr. Clark briefly abstracted a recent letter of Mr. Ahearn wherein it was stated that ready-mixed concrete producers were not subject to provisions of the Federal Wage and Hour Law unless the concrete is delivered across state lines. The fact that the cement might come across state lines has no bearing.

It will be remembered that the Ohio Ready Mixed Concrete Association was formed two years ago at a time when the subject of state licensing of delivery equipment came up. At that time it was ruled that delivery equipment was not subject to licensing, but subsequently the law was changed to provide for licensing such trucking equipment.

The Association was very active on this matter and, as the law now reads, the Ohio producers pay license fees on the basis of truck weight and cab weight, exempting the weight of any machinery not inherently motor vehicle equipment. This ruling, which has been in effect two years, has meant a considerable saving.

Mr. Clark, in discussing legislative matters, told of other cases in other industries coming up for reconsideration which must be watched for their possible effect on the existing licensing law.

Thirty-four members attended the meeting, which is a fine turnout for a State Association meeting. Ohio Ready Mixed Concrete Association now has 39 active members and five associate members, which number four mixer drum manufacturers and one cement company.

The HELTZEL TRUCK MIXER CHARGING PLANT

A fast—accurate—dependable truck mixer charger developed to meet today's increasing demands for ready mixed concrete. Furnished in any capacity with compartments for 3 or 4 aggregates and cement for either wet or dry batches — these plants meet all specifications. Write for complete information. Heltzel built-in quality insures life-time satisfaction.

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- BINS, Portable and Stationary
- CEMENT BINS, Portable and Stationary
- CENTRAL MIXING PLANTS
- BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)
- BITUMINOUS PAVING FORMS
- ROAD FORMS (with lip curb and integral curb attachments)
- CURB FORMS
- CURB AND GUTTER FORMS
- SIDEWALK FORMS
- SEWER AND TUNNEL FORMS
- CONCRETE BUCKETS
- SUBGRADE TESTERS
- SUBGRADE PLANERS
- TOOL BOXES
- FINISHING TOOLS FOR CONCRETE ROADS

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More than 16 years' experience in the manufacture of concrete pipe equipment and concrete pipe is built into this machine. Every part is designed for a lifetime of trouble-free service. Makes every size from 6 inches to 48 inches, both bell-end and tongue-and-groove. Let us show you how you can build a profit-making pipe plant.
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- Vibration
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The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

Ready Mix Directors Meeting Held in Chicago

ALTHOUGH not premeditated, the directors of the National Ready Mixed Concrete Association held their semi-annual meeting in Chicago, Ill., on the day before the city public works authorities opened bids on ready-mixed concrete for paving. This step, so far as the city was concerned, makes history, for labor rackets have hitherto prevented the introduction of ready mixed concrete into the city of Chicago for either public or private construction.

Aside from private conversation, however, the Chicago situation was not discussed; and the meeting was confined to routine subjects. The following directors were present: President Joseph H. Dixey, New York City; Stephen Stepanian, vice-president, Columbus, Ohio; A. J. O'Connor, vice-president, Detroit, Mich.; Alexander Foster, Jr., treasurer, Philadelphia, Penn.; Alexander Johnson, Brooklyn, N. Y., and past-presidents H. F. Thomson, St. Louis, Mo., and Jas. F. McCracken, Louisville, Ky. Also present were a number of visitors, including John Prince, Kansas City, Mo., B. F. Devine and G. K. Viall, Milwaukee, Wis.; F. H. Fleming, St. Louis, Mo.; S. A. Phillips and Nathan C. Rockwood, Chicago.

Convention Dates

The announcement was made that the dates of the January, 1941, conventions at Cincinnati, Ohio, will be: National Sand and Gravel Association and National Ready Mixed Concrete Association, simultaneously, January 15, 16, and 17; National Crushed Stone Association, January 20, 21, 22. The American Road Builders' Association will meet the week following.

Programs were discussed and it was the unanimous conclusion that the round-table type was by far the most interesting and instructive. Several favorable reactions were reported in connection with the little stage play put on under the auspices of H. F. Thomson at the 1940 St. Louis convention.

Executive Secretary Ahearn, in spite of the fact that he was suffering from a severe attack of laryngitis, reported at considerable length on government policies and acts, as they affect the industry. Particularly he emphasized the necessity of recognizing the ready-mixed concrete industry as a manufacturing or producing industry and not a branch of the building supply industry. The National Labor Relations Board is attempting to make the building supply business in interstate commerce if it distributes products made outside the state. The Board contends that since the products are sold to contractors and not to the ultimate consumer, the business is wholesale and not retail and hence comes under the Wage and Hour Act.

Director of Engineering, Stanton Walker, reported the publication (in June) of the Report of the Joint Committee on Concrete and Reinforced Concrete, which is going to contain some out-moded ideas on ready-mixed concrete. Ways and means of controlling the consistency of transit or truck mixed concrete are considered of great importance in establishing uniformity. Progress is being made by the equipment manufacturers toward the establishment of a Truck Mixer Bureau. Definitions are needed for (*a*) ready mixed concrete; (*b*) central mixed concrete; (*c*) shrink mixed concrete; (*d*) transit mixed concrete; (*e*) truck mixed concrete. The president of the association was voted authority to appoint a committee to write definitions.

Vice-President Stepanian suggested a plaque of the insignia of the National Ready Mixed Concrete Association on the cabs of the member company trucks. It was voted to pursue this suggestion, although the prevailing idea was that the insignia could be most readily used as decalcomania (picture transfers) than as plaques.

Membership in the association is growing, largely as a result of the St. Louis convention and the solicitations of prospects made by members. R. B. Young, of Toronto, Ont., was elected the first honorary member of the association.

Cement Colors

STAR and ANCHOR COLORS
Geo. S. Mepham Corp., East St. Louis, Ill.
C. K. Williams and Co., Easton, Penn.

From Sand to Ready Mix

CARL LOTZ SAND AND GRAVEL CO., Wausau, Wis., has purchased two 2-cu. yd. transit mixer trucks and has provided the necessary batching and weighing equipment at his sand pit for the production of ready-mixed concrete.

● Regardless of the machine or job—shovel, crane, hoist, scraper, elevator, whatnot—Hazard LAY-SET Preformed will give you the same amazing resistance to fatigue, the same uniformly long life—because Hazard LAY-SET is *"at ease."* The preforming process at the mill relieves the rope of locked up stresses; leaves it flexible, easy to handle, willing to work. Hazard LAY-SET Preformed is so calm, so thoroughly "at ease," that it has almost no tendency to kink, it resists whipping or rotating in sheave grooves, it spools better. More than this Hazard LAY-SET Preformed is a safer rope to handle. Being "at ease" broken crown wires do not spring out to tear workmen's hands and possibly cause blood-poisoning. For your next rope specify Hazard LAY-SET Preformed and be "at ease" yourself about its greater dollar value.

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Established 1846

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Wayne, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

GREEN SIGNIFIES SAFETY

AMERICAN CHAIN & CABLE COMPANY, Inc.

Shipping Bulk Cement By Truck

SANTA CRUZ PORTLAND CEMENT CO., San Francisco, Calif., is doing an unusual job of shipping large quantities of portland cement in bulk. Using special trucking equipment, the company is delivering 500,000 bbl. of cement for use in the debris dam being built by the federal government on the Yuba River between Marysville and Grass Valley. Seven combination truck and trailer units, each capable of transporting 120 bbl., are used in moving the cement.

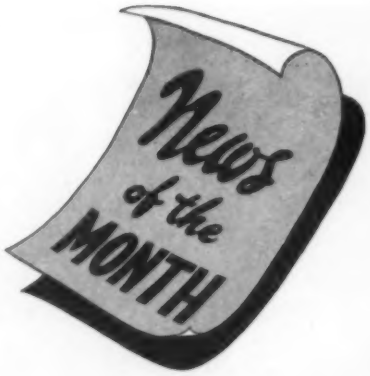
Monolith Celebrates Twentieth Anniversary

MONOLITH PORTLAND CEMENT CO., Monolith, Calif., recently celebrated its twentieth anniversary at a luncheon attended by 70 Kern County leaders. President Coy Burnett, in tracing the growth of the company, said that when the company purchased the property from the city of Los Angeles in 1919, the plant was producing 800 bbl. a day. The average now is 6400 bbl. A total of $5,000,000 has been spent in enlarging the plant during the past eight years. Mr. Burnett said that there is sufficient limestone around Tehachapi to run the plant for at least a thousand years.

Producing Aggregates for Friant Dam

CONSTRUCTION of Friant dam, Central Valley federal project, located 20 miles northeast of Fresno, Calif., will require about 2,000,000 cu. yd. of sand and gravel. To produce this requirement, Stephens-Adamson Co. (Los Angeles, Calif.) built the plant shown, which will produce 600 to 750 tons per hour. Contractors for the project, Griffith Co. and Bent Co., will operate the plant.

Aggregates plant which will produce 2,000,000 cu. yd. of sand and gravel for the construction of Friant dam, federal project near Fresno, Calif.



Lime Companies Expand

PHILLIPS LIME & SUPPLY CO., Seattle, Wash., has acquired a site for the construction of a $25,000 plant. This company has contracted to take the entire output of the Union Lime Co., Republic, Wash., and the new plant will be used to make lime putty. Two steel tanks 25-ft. high will be erected in addition to a warehouse and factory building, 30- x 86-ft. The Union Lime Co. is planning additional kiln capacity. In addition to lime putty, the Phillips Lime & Supply Co. will wholesale hydrated, pebble, pulverized, and agricultural limes.

Buy Quarry

THE READY MIXED CONCRETE CO., Kansas City, Mo., has purchased the 16-acre tract on which its quarry and south side mixing plant has been situated for the last 10 years. The property, owned by the Winn estate, was once used by the Kansas City Public Service Co., to obtain ballasting materials.

Panama Canal Zone Quarry Expands

SOSA HILL ROCK QUARRY will nearly double its capacity when the installation of new machinery is completed. Products from dust to 2½-in. will be crushed at the rate of 125 tons an hour. The work involves the installation of a primary crusher; a secondary modified gyratory rock crusher; five new bins of 1200 cu. yd. capacity; vibrating screens; conveyor belts; and other equipment. Kennedy-Van Saun Manufacturing and Engineering Corp., New York, N. Y., is furnishing the equipment which is being installed under the supervision of Panama Canal Zone authorities.

Buy Two Companies

ATLANTIC LIME CORPORATION, Charleston, S. C., has taken over the local operations of B. E. Benson and the Santee Limestone Co. which had contracted their output to the Atlantic company. Production will be increased from 100 tons to 400 tons per day, and plans have been completed for the construction of two storage warehouses for agricultural limestone at Holly Hill, S. C.

Ship Sand to China

ZANESVILLE SAND CO., Zanesville, Ohio has achieved the record for perhaps the longest shipment of sand by any company in the United States. Recently 600 lb. of its finest molding sand was sent to Yunnanfu, China via New York and Rangoon, India. Quarried and ground at the L. K. Brown plant near Newark, Ohio, the sand is said to be particularly suited to the casting of aluminum and Dow metal products, according to Fred Flegal, president.

Safety Code for Quarries

AMERICAN STANDARDS ASSOCIATION was recently authorized to plan a new safety code for workers in quarry, strip and open-pit mining. Twenty-three organizations have backed the proposal, including the U. S. Bureau of Mines, National Association of Mutual Casualty Companies, National Lime Association, National Safety Council, and various governmental and industrial associations.

Open New Quarry

ACCORDING to a recent newspaper report, Mr. Crouch of Carrollton, Mo., will open a quarry on the Charles Nance farm southwest of Bogard, Mo. There is a 9-ft. face with very little stripping to be done.

Top—View of plant showing tandem arrangement of EAGLE Dewaterers.

Bottom—Looking down on second EAGLE Dewaterer from which sand passes direct to conveyor belt.

TWO EAGLE

DOUBLE-SCREW DEWATERERS

increase efficiency of new Southern Sand and Gravel Plant

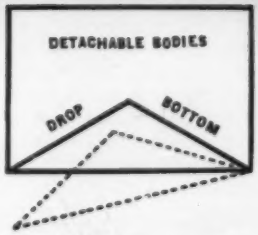
These two 18-ft. EAGLE double-screw dewaterers placed in tandem take the sand passing the vibrating screen—thoroughly scrub it—deliver it comparatively dry to the conveyor belt ready for storage at the rate of 50 tons per hour. This is another typical example of how EAGLE Washers increase the efficiency of sand and gravel plants. These dewaterers not only scrub the sand but deliver it dry enough so that the long conveyor belt which rises at a relatively steep angle can operate at maximum efficiency.

Let us show you how an EAGLE Washer will enable you to produce better products at less cost.

EAGLE IRON WORKS
DES MOINES, IOWA

DEMPSTER DUMPSTER

LF-2—ONE OF THE NEW MODELS



- *No High Pressure Hose*
- *No Counterweight*
- *No Auxiliary Jacks*

DEMPSTER-DUMPSTER Pays Its Own Way . . . Is Self-Liquidating . . . Turns Losses Into Profits. Get the Facts NOW! There's a Dealer Near You.

DEMPSTER-DUMPSTER is the spearhead of attack against operating wastes. One unit can serve four to ten buckets . . . does the work of four or five trucks. No wasted man-hours, no idle labor. The DEMPSTER-DUMPSTER is never idle on the job, constantly on "the go," no lost motion, no waiting for it to be loaded and returned. Buckets handle up to 6 yards, depending upon the material. Costly breakdowns are unknown with DEMPSTER-DUMPSTER on the job. Simply constructed of rugged materials, DEMPSTER-DUMPSTERS have been in service for more than 6 years without a major breakdown. Write for complete details. Just ask for Bulletin No. 501.

Exclusive sales territories available for responsible dealers — Wire for details

DEMPSTER BROTHERS, Inc. KNOXVILLE TENNESSEE

Universal 1836 and 936 Jaw Crushers, and 20x40 double corrugated rolls make profits for this operator near Hot Springs, Ark.

Another UNIVERSAL *Quarry Plant!*

This Universal designed and equipped plant turns out 700 tons of crushed rock daily that will pass a 7/8" screen. Entire plant is operated by a 6 cylinder diesel.

Universals are way ahead in economy of operation, low power and maintenance costs and, per dollar invested in equipment, they provide the greatest yardage return—whether it's a stationary or portable Universal Rock or Gravel Plant, or a Universal Crusher or Pulverizer. Ask for proof —we have it!

Write for new catalog.

UNIVERSAL CRUSHER COMPANY

617 C Avenue West **Cedar Rapids, Iowa**

UNIVERSAL

SEE THE FLEXOMOTIVE IN ACTION

TAKE A LOOK AT THE RECORD!

● Get an entirely new conception of the SERVICE you can expect from your locomotive. See the Flexomotive in action. Note its perfect visibility, its flexibility, its operating and maintenance economy. There's a Flexomotive working near you . . . ask us about it.

WRITE **PLYMOUTH LOCOMOTIVE WORKS**
Division of The Fate-Root-Heath Co.
PLYMOUTH, OHIO

Plymouth **FLEXOMOTIVE**

GIVES YOU EVERYTHING YOU WANT IN A LOCOMOTIVE!

Raise Grinding Capacity

FORD MOTOR Co., Dearborn, Mich., has installed air separators in its cement mill to increase the clinker grinding capacity and the specific surface area of the finished product. Each of two 7- x 26-ft. two-compartment mills is operating in closed circuit with a 14-ft. Raymond air separator. The grate bars within the mills have been opened up some and the rejects return into the first compartment, where they join the fresh feed of clinker and gypsum at the trunnions.

Capacity has been increased to 2600 bbl. of cement in 24 hr., as compared to 2000 bbl. in open circuit, and the surface area has been stepped up from 1500 or 1600 sq. cm. per gram to 2000 sq. cm. per gram. Circulating loads of about 120 percent are carried in each circuit, and the mills are vented by connecting screw conveyors in the circuits to existing dust collecting equipment.

The new product is sold as standard portland cement, the only product made in the plant. Air separation was installed to increase production to the output of the two 10- x 150-ft. kilns. Capacity in grinding clinker had fallen off due to the gradual increase of surface requirements.

Ohio Plant Rebuilt

OHIO MARBLE Co., Piqua, Ohio, has completely rebuilt its crushing and screening plant. The new plant, of all-steel construction, was designed and its construction was supervised by L. E. Townsend, superintendent. Capacity is about 250 tons per hour when producing fluxstone, which is equivalent to the capacity of a 2 cu. yd. shovel and four quarry trucks hauling about eight tons to the primary crusher. Capacity when producing commercial stone for other purposes will be 100 to 200 tons per hour depending upon the sizes produced. When completed, the new plant, having more screening surface, will be considerably better equipped to produce smaller sizes than was possible with the dismantled plant. Operations continued with the exception of a two week period while under construction.

More Cement Storage

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., has let a general contract to Chalmers & Borton Co., for an addition to the branch mill at Iola, Kans., for storage and distribution, consisting of a main one-story unit, 45- x 217 ft., and 85 ft. high, 20 silos, headhouse, bins and other structures. The cost with equipment will be about $150,000.

America's finest TRUCK MIXERS & AGITATORS

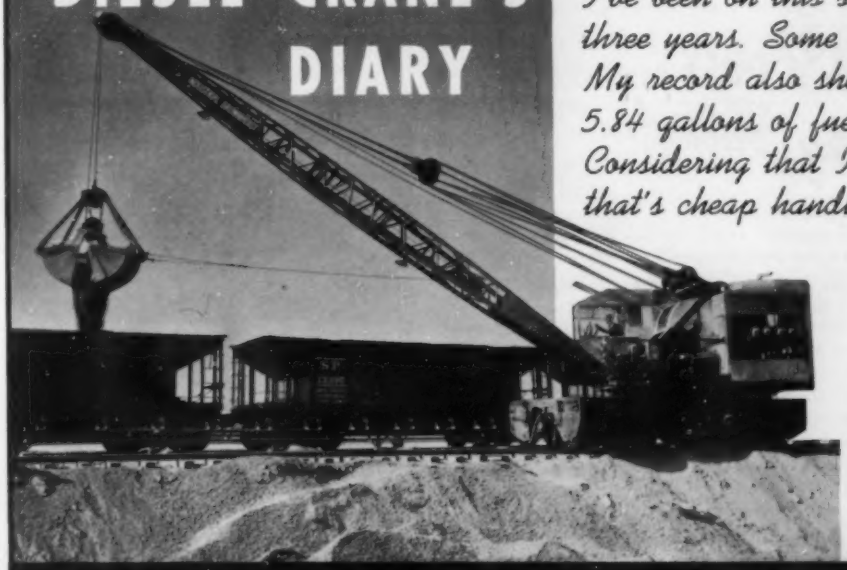
by Ransome

Higher Quality Concrete
at no additional expense.

There's a reason—
Send for the facts *today!*

RANSOME CONCRETE MACHINERY COMPANY
DUNELLEN NEW JERSEY

From a
DIESEL CRANE'S
DIARY



"Worked steadily for 16 hours again today, loading sand and gravel into cars. Just looked over my record and I've been on this same job now over three years. Some sand and gravel! My record also shows that I burn only 5.84 gallons of fuel oil per hour. Considering that I am a 40-ton crane, that's cheap handling!"

Everywhere, Industrial Brownhoist Diesel cranes are doing a real job for their owners, at a surprising saving. Cost figures are available for practically all kinds of work and sizes of cranes. Our nearest office will be glad to give these to you.

INDUSTRIAL BROWNHOIST

GENERAL OFFICES: BAY CITY, MICHIGAN
DISTRICT OFFICES
New York, Philadelphia, Pittsburgh, Cleveland, Chicago.

FINANCIAL NOTES

RECENT DIVIDENDS ANNOUNCED

Canada Cement Co., pfd. (Arrears June 21, $34.50)	$1.25	June 20
Consolidated Sand & Gravel, Ltd. (Toronto), pfd.	1.25	June 1
Lone Star Cement Corp.	.75	June 28
Mathieson Alkali Works.	.37½	June 29
Monolith Portland Cem. Co., pfd.	.25	May 16
Riverside Cement Co., pfd.	1.50	May 1
Schumacher Wall Board Co.	.50	May 15
Spokane Portland Cement Co.	.25	April 15
Spokane Portland Cement Co.	.25	Nov. 15
U. S. Gypsum Co.	.50	July 1
U. S. Gypsum Co., pfd.	1.75	July 1

Three Sly Dust Filters Exhausting Packing Machines and Conveyors in a Large Cement Plant

"We Have Found the SLY DUST COLLECTOR Very Satisfactory"

● "We are absolutely sold on the idea of eliminating all dust around our plants by the use of dust collectors and we have found the Sly Dust Collector very satisfactory," writes a prominent cement manufacturer.

How satisfactory this company has found Sly Collectors may be judged by repeat orders: Two years ago they purchased an installation of three filters for one of their pack houses. Later, two large filters in the finish mill. Then, two filters in another pack house. And since then—*eight additional filters in pack houses and finish mills of other plants of this same company.*

Sly offers definite advantages in economies in space and power. *Sly installations are not expensive.* In the cement mills of the United States and Canada there are more Sly Dust Filters by far than any other make (estimated at four times as many as the next most popular make).

Tell us about your dust problem in connection with crushing, grinding, screening, conveying rock products. Ask for new Bulletin No. 98.

THE W. W. SLY MFG. CO.

Branch Offices in Principal Cities

4746 Train Avenue Cleveland, Ohio

KELLEY ISLAND LIME & TRANSPORT Co., Cleveland, Ohio, has announced that sales in the first quarter of 1940 increased 20 percent over the 1939 figures. Net profit of the company for 1939 totaled $338,028. A 50-year lease of stone lands entered into in 1917 with Martinsburg Limestone Co., Martinsburg, W. Va., was sold to the Standard Lime & Stone Co.

•

CALAVERAS CEMENT Co., San Francisco, Calif., showed the following comparative statement of income and sales for the years ended December 31:

	1939	1938
Net sales	$1,590,173	$1,396,189
Cost of sales	1,040,937	1,054,384
Sell., etc., exp.	258,250	262,721
*Operating profit	291,086	79,083
Margin of profit	18.31%	5.66%
Other income	3,583	1,806
Total income	294,669	80,890
Loss, assets sold	12,572	16,956
Other deductions	**65,324	.....
Fed. income tax	39,863	11,252
Net income	176,911	52,682
Preferred div.	108,829	18,414
Surplus for year	68,082	34,268
Earn. surp., 1-1	255,239	220,972
Earn. surp., 12-31	323,321	255,239
Earn. pfd. share	$9.83	$2.86
No. of pfd. shares	17,999	18,414

*After depreciation and depletion 1939, $144,875; 1938, $140,602.

**Expenditures in connection with county road to plant, $26,067; development and experimental expenses, $22,257; San Francisco Bay exposition subscription, $17,000; total, $65,324.

•

LOCK JOINT PIPE Co., Ampere, N. J., concrete pipe manufacturer and sand and gravel producer, reported a net income of $1,455,393 for the year ended December 31, 1939. This compares with a net income of $130,936 for a similar period in 1938. Gross sales were $9,901,509 in 1939 as against $1,887,518 in 1938.

•

PACIFIC COAST CEMENT CORP., Seattle, Wash., presented the following statement of income for the years ended December 31:

	1939	1938
Gross earnings	$672,935	$ 91,610
Oper. expenses	36,103	34,669
Depreciation and depletion	110,490	107,951
Net oper. profit	526,342	d 51,010
Other income	7,062	12,695
Total income	533,403	d 38,315
Bond interest	92,676	92,831
Other interest	13,176	12,878
Amortization discount & expense	16,255	18,924
Other charges	777	1,559
Income tax reserve	69,596	.....
Earn. deficit, 1-1	962,513	798,007
Earn. deficit, 12-31	621,589	962,513
Times charges earned	4.34	.....
Net profit	340,924	d 164,506
Earn., pfd. share	$45.46	Nil
No. of pfd. shares	7,500	7,500

•

UNITED STATES STEEL CORP., New York, N. Y., has reported earnings of subsidiaries operating in the rock products industries: Michigan Limestone & Chemical Co., had a net profit of $453,002, and the investment rep-

resented $5,826,723. Dividends paid to the steel company by the subsidiaries included the following: Universal Atlas Cement Co., $1,470,000; Michigan Limestone & Chemical Co., $300,225; Pittsburgh Limestone Corp., $300,000.

•

KENTUCKY ROCK ASPHALT CO., Louisville, Ky., has reported a net profit of $70,843 for the year ended December 31, 1939. This compares with a deficit of $18,586 for the year 1938. Gross sales of $554,374 in 1939 compared with $697,239 in 1938.

•

CEBU PORTLAND CEMENT CO., Philippine Islands reported a net profit of 986,171.89 pesos. A cash dividend of 10 percent was recently declared. Of the total sales, 63.93 percent was made to the Bureau of Public Works, and other governmental departments. Dr. Anonas, chairman, revealed that the cement plant now produces about 3700 bbl. per day.

•

INTERNATIONAL AGRICULTURAL CORP., New York, N. Y., has announced the abandonment of its plan to recapitalize, and arrangements have been made to refund its outstanding $4,500,000 5 percent bonds at a lower rate of interest. Bonds were called for redemption on May 1, 1940.

•

ASSOCIATED PORTLAND CEMENT MANUFACTURERS, LTD., London, England, announced that production totaled 2,578,760 tons in 1939 as compared with 2,492,146 tons in 1938. Income totaled 1,402,925 pounds in 1939 as against 1,661,209 pounds in 1938.

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AMERICAN AGRICULTURAL CHEMICAL CO., New York, N. Y., reports a net profit of $94,630 for the first quarter of 1940. This compares with a net profit of $132,947 for the same period in 1939.

•

NORTH AMERICAN CEMENT CO., New York, N. Y., showed a net loss of $415,387 after taxes, depreciation, depletion and interest, but before profit on bonds purchased, comparing with a net loss of $780,770 for the year ended March 31, 1939.

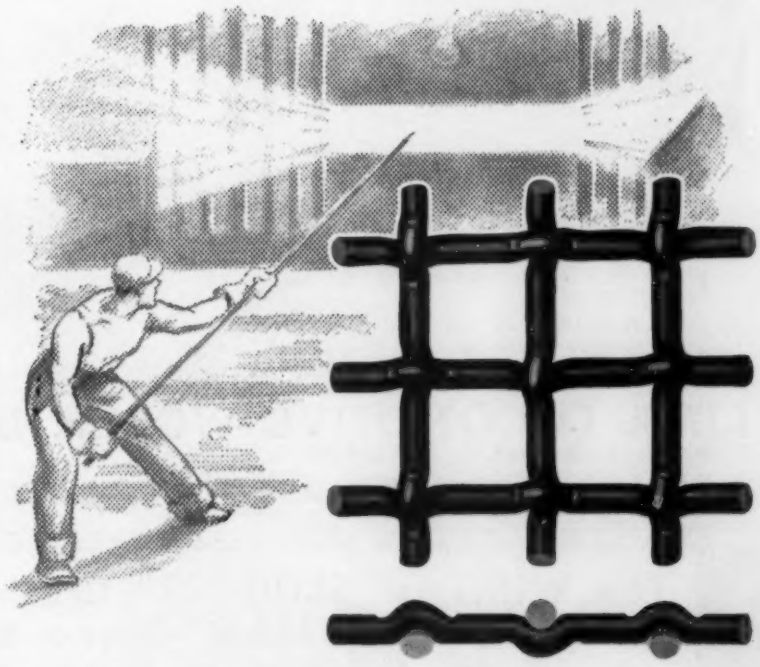
•

ARUNDEL CORP., Baltimore, Md., reports for the quarter ended March 31, 1940, a profit of $84,351, after depreciation, etc., but before federal income taxes, comparing with a profit of $219,314 in the first quarter of 1939.

•

BOSTON SAND & GRAVEL CO., Boston, Mass., reported a net loss of $2852 for the year ended December 31, 1939, as against $14,009 for 1938.

THIS STEEL MAKING METHOD PUTS *LONG LIFE* INTO ROEBLING SCREENING!



THE cost of replacing screening is an important item to you. That's why you are vitally interested in getting long screening life.

Of course, how much life you *do* get out of your screening depends largely on the steel of which it is made. And, right here, it will pay you to remember this about Roebling "Abraso" Screening:—

Roebling makes its own screening steel—and, therefore, can assure you of a steel which possesses the toughness, and the wear and fatigue resisting qualities, which are so essential in economical screening service!

This Roebling Steel is made by Roebling's *custom-method*, in special small, open-hearth furnaces. Therefore, each lot of steel can be carefully watched and controlled—to assure strict uniformity and the desired high degree of resistance against wear and vibration.

Let us show you evidence of what this means in the way of screening economy in actual service. Our nearest office will gladly furnish the facts.

JOHN A. ROEBLING'S SONS CO.
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING ABRASO SCREEN

TRADE JERSEY MARK

90 YEARS OF WIRE MAKING SPELLS THE DIFFERENCE

LIMA EXCAVATORS

FIT INTO ANY EXCAVATING PICTURE

Whether your work requires a shovel or dragline, you will find in LIMA'S complete line, a machine that will fit your requirements exactly. LIMA excavators are built in sizes ranging from ¾ yard to 3 yard capacity, with ability to handle the toughest job.

These are a few of the advantages that are yours when you own a LIMA.

1 Special steels are used throughout to effect longer and profitable operation, with fewer delays.

2 Arrangement of machinery affords proper balance for handling long booms at low angles.

3 Independent clutches — hoist, travel, swing and boom up or down simultaneously.

4 Big diameter drums with wide face effect greater cable economy.

5 Roller bearings at every vital bearing point, reduces friction to a minimum.

6 Helical cut gears throughout the main machinery affords smooth, quieter operation.

LIMA LOCOMOTIVE WORKS, INCORPORATED

SHOVEL AND CRANE DIVISION — **LIMA, OHIO**

Newark, N. J. · Los Angeles, Calif. · Spokane, Wash. · New York, N. Y. · San Francisco, Calif. · Dallas, Texas · Montreal, Quebec, Canada · Portland, Oregon · Seattle, Wash. · Memphis, Tenn. · Philadelphia, Pa. · Vancouver, B. C.

The Williams "SLUGGER" Crusher and Pulverizer Handles "ONE MAN" Stone ● Saves Sledging

Also Makes 1¼", ¾" or Agricultural Limestone in One Operation

CUTAWAY VIEW of "Slugger" showing heavy duty hammers, liners and discs.

By reducing large rock to 1¼", ¾" or agricultural limestone in one operation, the "Slugger" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Features include—Manganese steel hammers, heavy duty SKF bearings, adjustable breaker plate, hammer adjustments overcome wear, economical to operate.

The "Slugger" is built in Seven Sizes—from 30 to 150 horsepower —write for illustrative bulletins today.

The Williams Patent Crusher and Pulverizer Co.

800 St. Louis Ave., St. Louis, Mo.

SALES AGENCIES

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OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

Williams

PATENT CRUSHERS GRINDERS SHREDDERS

Basalt Rock Buys More Equipment

BASALT ROCK CO., Napa, Calif., recently placed in service a new 3-cu. yd. Bucyrus-Monighan walking dragline with a 90-ft. boom for removal of sand and gravel in a new deposit. Three special trucks made by the Euclid Road Machine Co., each powered with a 165-hp. Waukesha engine using butane gas for fuel, also were purchased for this job. The four tires on the semi-trailer are specially built, 18- x 24-in. pneumatics, to carry the 30-ton loads.

Memorial to be Built For Marquette Founder

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., has announced through Richard Moyle, Sr., vice-president in charge of operation, that construction would soon start on a civic center building in Oglesby, Ill., which will be erected and operated by the Theodore G. Dickinson Foundation as a memorial to the late founder and president of the company. Richard Moyle, Sr., is president; Bertha K. Evans is vice-president and treasurer, and Walter A. Wecker, president of Marquette, is secretary of the Foundation. The building, which will cost $90,000, will be built entirely of monolithic concrete. It is planned to use the building for study and vocational purposes, and it will also serve as a recreation center as it will contain a swimming pool and four bowling alleys.

Concrete Pavement Yardage

AWARDS of concrete pavement for April, 1940, have been announced by the Portland Cement Association as follows:

Type of construction	Sq. yds. awarded April	Total sq. yds. during first 4 months
Roads	3,170,087	9,023,585
Streets and Alleys	887,551	3,238,558
Airports	63,070	400,918
Totals	4,120,708	12,663,061

Adds New Finish Mill At Wolverine

WOLVERINE PORTLAND CEMENT CO., Coldwater, Mich., has replaced nine old Griffin mills on the finish end with a Bradley-Hercules preliminary mill. Finish grinding is in tube mills with air separation.

Testing for Lime Plant In Montana

JOHN MCLELLAN of Libby, Mont., has built a pilot shaft kiln for the purpose of testing out a deposit of local limestone for the purpose of determining its suitability for the manufacture of lime. In the early days lime was made from this deposit, and it is expected that the tests will be successful. Analysis shows that the rock will make a magnesium lime which will not only be suitable for building purposes but also for agricultural uses.

Purchase Stone Concern

FRANCE STONE CO., Toledo, Ohio, has announced the purchase of the Blosser Stone Co., located in Washington township near Grover, Ohio, formerly owned by J. . Blosser and Guy R. Schultz.

New Owner

AMERICAN AGGREGATES CORP., Greenville, Ohio, has taken over the Ray Sand and Gravel Co. plant at Oxford, Mich., and is contemplating certain improvements.

Public Hearing

P. H. BATES, chairman, Committee on Cement, Lime and Plaster, Federal Specifications Executive Committee, Washington, D. C., has asked that the following announcement be made in regard to the proposed amendment to the Federal government specification on hydrated lime for structural purposes:

"The Committee on Cement, Lime and Plaster of the Federal Specifications Executive Committee will hold an open meeting on Friday, June 28, 1940 at 1:30 p. m., eastern standard time, in Room 301, Industrial Building, National Bureau of Standards, Washington, D. C., to permit all persons interested to present their thoughts regarding the proposed amendment to Federal Specification SS-L-351, Hydrated Lime for Structural Purposes.

"The proposed amendment consists of a paragraph to be added to the detail requirements of the above referred to specification, which states: 'The total free (unhydrated) calcium oxide (CaO) and magnesium oxide (MgO) in the hydrated product shall not exceed 8 percent by weight (calculated as on the received basis'". The amendment also comprises a method of chemical analysis through the use of which it is possible to determine if the lime has been hydrated to the extent set forth in the specification.

Builds Steel Silos for Plaster Sand

JOHN D. GREGG, Whittier, Calif., has a beautiful advertisement in the form of steel silos recently completed for storage of unwashed plaster sand at

New steel silos for unwashed plaster sand at Roscoe, Calif., plant of John D. Gregg

his Roscoe plant. The bins are an addition mentioned in an article featuring this plant in the April, 1940, issue of ROCK PRODUCTS, pp. 29-30, and have about 1000 tons capacity each.

Lime Shipments

NATIONAL LIME ASSOCIATION, Washington, D. C., reports shipments of 138,015 tons of lime by all reporting plants during March. Ratio of shipments to capacity was 46.7 percent which was slightly higher than a year ago.

New Gravel Firm

CUPEROUS BROS., Hull, Iowa, have formed the Le Mars Gravel Co. to operate a wet pit on the Ahlfs farm, two miles south of Struble, Iowa. A 4-in. pump takes material to the washing, screening and crushing plant.

Sand-Lime Brick Production and Shipments

EIGHT active sand-lime brick plants reporting for April and nine for March, statistics for which were published in May:

AVERAGE PRICE FOR APRIL

	Plant Price	Delivered Price
Detroit, Mich.		$14.50
Grand Rapids, Mich.		14.00
Milwaukee, Wis.	$10.00	12.50
Mishawaka, Ind.	11.00	....
Saginaw, Mich.	10.90	....
Seattle, Wash.	14.50	16.50
Sebewaing, Mich.	10.00	....
Syracuse, N. Y.	14.00	16.00C/L 20.00L/C

STATISTICS FOR MARCH AND APRIL

	†March	‡April
Production	805,980	1,520,430
Shipments (rail)	55,000	92,500
Shipments (truck)	1,063,290	1,809,750
Stock on hand	720,574	1,524,772
Unfilled orders	1,800,000	425,000

† Nine plants reporting; incomplete, one not reporting production, four not reporting stock on hand, and five not reporting unfilled orders.

‡ Nine plants reporting: incomplete, one not reporting production, two not reporting stock on hand, and five not reporting unfilled orders.

Important Anti-Trust Decision

THE United States Supreme Court, in its decision in the so-called Madison oil case, in upholding the lower court, has annihilated the "rule of reason" decisions of a decade or more ago. According to the *Wall Street Journal* this decision and the other recent anti-trust decisions, including that in the Ethyl Gasoline Corp case, Supreme Court approval of the following doctrines can be set down without qualification:

(1) Mere existence of power to restrain trade, acquired through combination for that purpose, makes the holder of that power a violator of the trust laws.

(2) "Reasonableness" of the restraint constitutes no defense.

(3) In open market price-fixing cases, it is not necessary to prove that the alleged violators controlled a "substantial" part of the market, nor that the combination by itself, and apart from other factors, controlled the prices.

(4) In patent cases, the holder of the legal patent monopoly cannot use the patent to achieve controls over secondary distribution markets which, if achieved by other means, would be in violation of the anti-trust laws.

(5) In price-fixing cases, it is not necessary to show that the combination sought "uniform and inflexible" prices. The prices are "fixed" in the legal sense simply because they are agreed upon, even if they fluctuate.

In addition, there is a strong implication in Justice Douglas' opinion that a violation of the law could be proved to the satisfaction of the court by showing that a combination existed and that it has a restraining effect but without a showing that the combination was formed for the purpose of restraining trade.

The same authority (*Wall Street Journal*) says that Justice Douglas' opinion immeasurably strengthens the power of the Justice Department in anti-trust prosecutions. The department can more easily show that a power to restrain trade exists and was acquired for that purpose than it can prove just where and how and with what total effect the power has actually been put to use.

"Proof that there was a conspiracy," said Justice Douglas, "that its purpose was to raise prices, and that it caused or contributed to a price rise is proof of the actual consummation or execution of a conspiracy under section one of the Sherman Act," holding with the trial court judge that price-fixing agreements are per se violations of the law.

Conspiracies under the Sherman Act, he stated, are on a common law footing; that is, they are not dependent upon the "doing of any act other than the act of conspiring" as a condition of liability. "Under the Sherman Act," the opinion stated, "a combination formed for the purpose and with the effect of raising, depressing, fixing, pegging, or stabilizing the price of a commodity in interstate or foreign commerce is illegal per se."

The possibility that factors other than the combination may have contributed to the rise in prices is immaterial, said Justice Douglas.

Similarly, the fact that the prices paid by the combination varied and were not "fixed" in the sense of being uniform and inflexible was held to be immaterial. They were "fixed" in the legal sense because they were arrived at by agreement within the alleged combination.

In commenting on the recent decision Thurman Arnold, assistant attorney general, said:

"The Madison oil case is of far-reaching importance because it decides finally and decisively that industries may not join together to put a floor under prices on the plausible excuse that any competition which hurts is a competitive evil. The effect of such a standard was to destroy the meaning of competition and permit any large combination to drive out of the market competitors who cut prices enough to give the consumer real relief."

Agricultural Limestone In Heavy Demand

REPORTS from all sections of the country indicate that there has been a heavy demand for agricultural limestone.

•

ORDERS for agricultural limestone as grants of aid by Tennessee farmers passed the 100,000 ton mark in April, according to F. W. Colby, state AAA administrative officer.

•

AT OAKDALE, MO., L. E. Lyman has installed a second crusher to supply the government contract for agricultural lime in Shelby County.

•

GENE BABB has installed a larger stone crusher for his agstone business. The plant is located near Washburn, Mo.

•

R. NEWTON MCDOWELL CO., is stripping a quarry site near Ravenwood, Mo., on the E. C. Gooden farm from which rock will be taken for crushing agricultural limestone. Two 9-cu. yd. tractor scrapers are being used for stripping.

•

PLANS ARE completed for a new agricultural limestone grinding plant at Appomatox, Va., for the State. It is said that the plant will cost $25,000. A. M. Johnston is manager of the existing plant which will be replaced.

Shasta Dam Aggregates Plant in Operation

COLUMBIA CONSTRUCTION CO., Redding, Calif., has rebuilt the conveyor belt bridge at Coram which was swept away by flood waters, and gravel is being moved to the site of Shasta dam. Aggregates will be shipped to the damsite on the belt five days per week, eight hours per day, until the track hoppers and stockpiles have been filled. Pouring of the concrete will not start at the damsite until sometime in July, according to recent reports.

Long Island Producers Fined $50,000

LONG ISLAND Sand and Gravel Producers' Association and eight of its corporate members were fined a total of $50,000 recently by Federal Judge Henry W. Goddard on the charge that the defendants interfered with interstate sand and gravel industry by controlling prices. The Association was fined $10,000 and each company $5000.

Fire Destroys Amiesite Plant

INTERSTATE AMIESITE CO., Camak, Ga., has reported the destruction of its road mix plant by a fire which gutted the structure. The structure will be rebuilt and new equipment purchased.

Making Dust Survey

WASHINGTON-IDAHO LIME PRODUCTS CO., Orofino, Idaho, has been making a dust survey at its plant with the object in view of installing a dust collection system. It is also planned to add to its kiln facilities.

Cement Plants Start Up

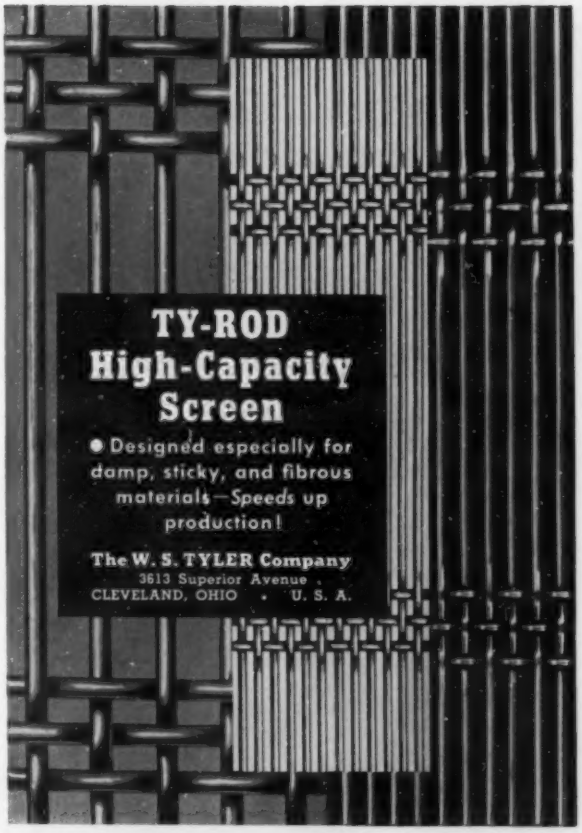
ASHGROVE LIME & PORTLAND CEMENT CO., Chanute, Kan., has resumed operations after a shut-down on January 30 this year.

•

COLORADO-PORTLAND CEMENT CO., Fort Collins, Colo., resumed operations April 15, and it is anticipated that the plant will run continuously this summer and fall.

•

NEBRASKA CEMENT CO., Superior, Nebr., reported that its kilns were again operating on May 13 after a two-months shut-down.



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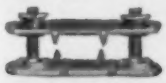
● **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

● Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.



● **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Five sizes in steel and alloys.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

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New Gardner-Denver S73 SINKING DRILL

Here's the new speed and power necessary to drill faster in harder ground—to drill deeper holes—without the handicap of more weight!

It's the new Gardner-Denver S73 Sinker, weighing only 67 pounds. It uses no more air than the average 55-lb. drill . . . has excellent holding characteristics enabling the drill runner to maintain a high rate of drilling speed throughout the shift.

The new Gardner-Denver S73 Sinker is ideal for general drilling where increased footage in hard ground is desired. Get complete facts on this time-saving, cost-saving, easier-handling drill—write for bulletin. Gardner-Denver Company, Quincy, Illinois.

SPECIFICATIONS

Type of Drill	Wet or Dry Sinker
Length of Drill overall	Collared, 25"; Lugged, 24½"
Hammer Diameter	2¾"
Size of Steel recommended	⅞" to 1¼" Hex., Rd., or Q. O.
Size of Air Hose recommended	¾"
Size of Water Hose recommended	½"
Weight with Lugged Chuck (Wet)	74 lb.
Weight with Collared Chuck (Dry)	67 lb.
Weight boxed for shipment	100 lb.

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These thirty-nine manganese hammers for pulverizing cement rock were hard surfaced with Colmonoy Sweat-on Paste, applied with carbon arc. Only 6 lb. were required for the entire set of hammers.

After every run of 10,000 tons of cement rock through the mill, new applications of 1½ lb. of Colmonoy were made, 15 applications in all. These Colmonoy coated hammers handled 158,000 tons, as against 77,000 tons for uncoated hammers.

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Write for Catalog

FREE ! New Literature

THE bulletins and catalogs described below are for your benefit. To save you the necessity of writing individual letters, those you want can be obtained by merely checking and mailing the post card on this page.

1 AIR SEPARATORS.—Raymond Pulverizer Division. Bulletin No. 46 contains sectional views of the construction details of the Raymond mechanical air separator with single or double whizzer, explaining its action and the nature of results obtained with whizzer-equipped air separators.

2 BATCHING EQUIPMENT.—Roads Construction Co., Ltd., has issued a circular about its equipment for batching operation. The Noble automatic batcher and the Noble portable bulk cement unit with a handling capacity of 800 sacks per hour are featured.

3 BUCKET LOADERS.—N. P. Nelson Iron Works, Inc, has issued a circular about its line of portable bucket loaders Numerous illustrations of different models in action are shown.

4 BULK CEMENT PLANT.—Heltzel Steel Form & Iron Co. Bulletin T-28-BC is a detailed presentation of the Heltzel Model E-1 portable bulk cement plant. The entire unit can be easily assembled and features dustless batching.

5 COMPRESSORS.—Curtis Pneumatic Machinery Co., has issued two circulars; one describes and illustrates the Curtis line of air compressors, air hoists, and fittings and the other presents various applications of the Curtis hydraulic lifting cylinders for material handling and elevating.

6 CONCRETE BLOCK.—Concrete Transport Mixer Co., Inc., has issued a circular about the Kirkham Vibrator block machine, a sturdy unit, simple to operate, and with a normal rate of production of 5000 brick or 800 8- x 8- x 16-in. block.

7 CONCRETE UNITS. — Hollostone Machine Co., has issued a circular describing and illustrating the Hollostone machine and the steps in making Hollostone vibrated units. Another circular is a pictorial presentation of the kinds of structures made with Hollostone units.

8 CONVEYOR BELT FASTENER.—Flexible Steel Lacing Co. Bulletin No. F-100 describes the Flexco HD belt fasteners and rip plates for joining conveyor and elevator belting of any width.

9 CONVEYORS. — Jeffrey Manufacturing Co. Catalog 730, on the Jeffrey Mass-Flo conveyor, presents the principle of operation of this material handler. Arrangements for handling difficult conveying or elevating conditions are shown.

10 CRANE, CRAWLER.—Lima Locomotive Works, Inc., has added to its line a 60-ton heavy-duty crawler crane. This is illustrated and its features described in the New Machinery and Equipment Section.

11 CONVEYOR SYSTEMS.—Barber-Greene Co. Bulletin 676 is profusely illustrated with views of typical installations of Barber-Greene conveyors both for surface ground storage and underground handling of coal. It contains many ideas of material handling by conveyors which can be used in the rock products industry as well.

12 CRANE, MOTOR.—Thew Shovel Co., announces a full revolving convertible crane mounted on a 10-wheel, rubber-tired mounting. The "Moto-Crane" is described in the New Machinery and Equipment Section.

13 CRUSHER, ROLL.—Pioneer Engineering Works has recently added a roll crusher with fine corrugated rolls to produce fine materials. Its features and dimensions are described in detail in the New Machinery and Equipment Section.

14 CRUSHERS.—Pennsylvania Crusher Co. Bulletin 1030 contains information about the Pennsylvania Reversible hammermill. Its reversible action, how this gives the crusher related primary and secondary "crushing zones" and the impacting action are featured.

15 EXCAVATOR CONTROL. — Harnischfeger Corp. Bulletin X-60 describes and illustrates the new control system being installed on its ⅜-, ½-, and ¾-cu. yd. excavators. The control is said to be a new system on excavators, each clutch and brake being operated by its own master cylinder through hand levers or foot pedals.

16 DIESEL-ELECTRIC SET. — Caterpillar Tractor Co. has added a 66-kw. and a 52-kw. unit to its line of Diesel-electric sets. Capacities and performance of these units are described in the New Machinery and Equipment Section.

17 DIESEL ENGINES.—Chicago Pneumatic Tool Co., has released a new edition of Bulletin 768 describing its type 8 and 9 Diesels for continuous, heavy-duty stationary service.

18 DUST CONTROL SYSTEMS.—American Air Filter Co., Inc. Bulletin 270 presents the applications of the Roto-Clone dust control to meet a wide diversity of dust problems. Its compact and simplified design is said to permit the entire unit to be located near the source of the dust.

19 EXCAVATORS.—Koehring Co. has issued a circular about the operation of its 703 and 803 as a convertible dragline, clamshell or crane. These units are especially suited for operation with long booms, for long reach, and for high lifts.

20 FANS.—American Blower Corp. Bulletin No 3624 describes and illustrates the American Blower line of mechanical draft equipment. It also contains data on mechanical draft fan selection and typical draft fan arrangements.

21 FLEXIBLE COUPLINGS.—Lovejoy Flexible Coupling Co. has issued a catalog with complete description, applications, and specifications of the line of L-B flexible couplings made in all sizes from ¼-in. to 10-in. bores.

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22 GEAR MOTORS. — Reliance Electric & Engineering Co. Bulletin 404 is about the Type S Reliance a.-c. and d.-c., double and triple reduction gearmotors It lists certain features highly desirable in reducers and points out how well the Reliance motors meet these conditions

23 GRAVEL PLANTS.—Smith Engineering Works. Bulletin No. 268-D contains flow sheets and descriptions of operation, equipment and capacities of gravel plant layouts for use with various types of deposits and to produce various grades of material.

24 KILN RECORDER.—General Electric Co. has developed a duplex recorder for recording simultaneously kilowatts and rkvs, kilowatts and frequency, or volts and amperes. Details of it appear in the New Machinery and Equipment Section.

25 LOADING AND HAULING EQUIPMENT.—Brooks Engineering and Mfg. Co., has issued a folder called "Helping the Man with the Shovel." It shows the operation of the Brooks Load Lugger and tells how it can speed up and make easier hand loading jobs.

26 LUBRICATION. — The Texas Co. The April issue of Lubrication contains a clear and comprehensive 11-page illustrated study on the proper lubrication for various types of electric motor bearings.

27 LUBRICATION SERVICE. — Gulf Oil Corp. has issued a booklet giving complete details of its periodic consultation service, a lubrication procedure designed to insure higher efficiency and lower costs for maintenance and operation of machinery.

28 PUMP, DIAPHRAGM.—The Dorr Co., Inc. Bulletin No. 5001 is about the Dorrco V-type diaphragm pump, designed for handling of sludges, pulps or slimes, containing appreciable quantities of solid material. The bulletin features improvements recently made.

29 PUMPS.—Peerless Pump Co. "100,000 Raindrops from Underground for 1c" features various types of Peerless deep well water pumps and shows open section views of Peerless pumps.

30 READY-MIXED CONCRETE. — Chain Belt Co. Bulletin No. 363, entitled "Rex Big Mixers for Modern Mixing Plants," describes the Rex 28-S, 28 cu. ft. and 56-S, 56 cu. ft. mixers and illustrates the machines and their component parts.

31 ROCK DRILL ACCESSORIES.—Ingersoll-Rand Co. Form 2410 illustrates and furnishes data on accessories necessary for efficient rock drilling. The application and operation of some of the newest I-R equipment for this purpose is included.

32 SCRAPER, FOUR-WHEEL. — Bucyrus-Erie Co. has introduced a new line of four-wheel scrapers in a complete range of sizes matched to the new line of International TracTracTors. Their features and operations are explained in the New Machinery and Equipment Section.

33 SCREENS. — Iowa Manufacturing Co. Bulletin SS-1 is about the construction features and advantages of the Cedar Rapids Symons vibrating screens. It also shows the screen at work in the field and tells about the results being obtained in each case.

34 SCREENS. — Allis-Chalmers Mfg. Co. Bulletin B-6088 illustrates and describes their Sta-Kleen low-head horizontal screen. The secondary deck has rubber balls that give a secondary vibration, preventing blinding and making the screen particularly effective in screening damp slack and other moist material.

35 SCREENS.—Nordberg Mfg. Co. Bulletin 96 points out the operating features of the Symons Type F screens It discusses the advantages of flat screening and illustrates typical installations which are producing a material meeting rigid specifications.

36 TRAILERS.—Sanford-Day Iron Works, Form 1255-K is about the Sanford-Day automatic bottom discharge trailer. This is a hauling unit featuring a series of bottom discharge doors which open and close automatically.

37 TRUCKS.—Chrysler Corp., Dodge Division, is distributing a pamphlet on the 2-speed axles used in Dodge job-rated dual-purpose truck models. Quoted as an example is excavation work, where power is needed for pulling out heavy loads and speed for returning light.

38 TRUCKS. — Marmon-Herrington Co., Inc., Form 400307 contains illustrations, detailed specifications and a summary of important features of the new models of the Marmon-Herrington heavy-duty all-wheel-drive trucks.

39 V-BELTS.—Allis-Chalmers Mfg. Co. now has ready a revised catalog section, No. 151, introducing new horsepower ratings for multiple V-belt drives based on the formula developed by Robert F. Vogt and recently adopted by the industry.

40 VOLTAGE REGULATORS.—General Electric Co. Bulletin GES-2285 describes type AIRS voltage regulators to keep electric motors operating at their full speed by holding a correct voltage for maximum speed. The effect of this device on shovel operation is described.

41 WEIGHERS, AUTOMATIC. — Streeter-Amet Co., has issued a folder containing bulletins describing and illustrating its line of automatic weighers and recorders. One is about the LB2 recorder; an automatic control and recorder for batching as many as four ingredients.

42 WIRE ROPE CLIP.—Thomas Laughlin Co. has developed a clip in which the bolts and identical bearing surfaces on opposite sides equalize pressure on the rope, which is said to improve performance. The clip is described and illustrated in the New Machinery and Equipment Section.

43 WIRE ROPE SLINGS.—Macwhyte Wire Rope Co. has issued a 56-page handbook containing reference tables, information, data and photographs on wire rope slings.

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(6-40)

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Traffic and Transportation

PROPOSED RATE CHANGES—The following are the latest proposed changes in freight rates up to and including the week of May 18:

Central

61882. **Sand, all kinds, and gravel, in** open top cars, C. L. Establish on, from Chardon, O., to Canton, 110c; Fairport, Harbor, 44c; Lorain, 105c; Massillon, 116c; Midvale, 127c; Newton Falls, 94c; Philo, 160c; Ravenna, O., 99c net ton.

61884. **Industrial sand as per usual** descriptions (a), (b) and (c). Establish on, from Arenzville, Ill., to Crawfordsville, Ind., (a) 209c; (b) 230c; (c) 187c net ton, via C. B. & Q., Litchfield, Ill., N. Y. C. (C); C. B. & Q., Peoria, Ill., N. Y. C. (C); C. B. & Q., Smithboro, Ill., P. R. R. Other routes desired to be furnished by interested carriers.

61902. **Sand** (except industrial), and gravel, C. L., in open top cars. Establish on, from Mt. Carmel, Ill., to Tecumseh, Ind., 98c net ton, via N. Y. C. R. R. (C) direct through Evansville, Ind.

61903. **Stone,** crushed; stone screenings, in bulk, in open top cars, straight or mixed, C. L. Establish on, from Milltown and Marengo, Ind., to Petersburg, Ind., 80c net ton, via Sou. Ry., Oakland City, Ind., and N. Y. C. (C).

61995. **Sand** (except industrial), in open top equipment, C. L. Establish on, Essex, Ill., to Kokomo, Ind., 138c net ton.

61997. **Stone, fluxing, furnace or foundry, melting or refractory** (unburned), in bulk, in open top cars, C. L. Establish on, from Scioto, O., to Canton, Massillon, O., 101c; Steubenville, Youngstown, O., and Weirton, W. Va., 116c gross ton.

61998. **Crushed stone, crushed stone screenings, in bulk,** in open top cars only, C. L. Establish on, from Joliet and Lehigh, Ill., to South Bend, Ind., 84c net ton.

62002 (1). **Stone, crushed, slag or** gravel, coated with oil, tar or asphaltum (See Note 7), in open top equipment, C. L. Establish on, from Lamson, Mich., to Standish, Mich., 283c; Twining, Mich., 295c; E. Tawas-Tawas City, Mich., 308c; West Branch, Mich., 207c net ton.

62020. **Stone,** crushed in bulk, in open top cars and crushed stone screenings, in bulk, in open top cars, C. L. Establish on, from Spore, O., to Huntington, W. Va., 187c net ton.

62022. **Lime (calcium), carbonate of (recarbonated waste),** in packages or in bulk, C. L., min. wt. 50,000 lb. Establish on, from Wyandotte, Mich., to Yellow Springs, O., 14c.

62005 (2). **Lime (calcium), carbonate of (recarbonated waste) (whiting substitute),** C. L., min. wt. in bags or in bulk 50,000 lb., in other packages 40,000 lb. Establish on, from Wyandotte, Mich., to Hamilton, Kitchener, Ont., 20c; Montreal, Que., 36c; New Toronto and Toronto, Ont., 22c.

62058. **Lime (calcium) carbonate of (recarbonated waste)** in pkgs. or in bulk, C. L., min. wt. 50,000 lb. Establish on, from Wyandotte, Mich., to Chillicothe, and Franklin (Warren Co.), O., 14c.

Sup. 1 to W. D. A. 62058. **Lime (calcium) carbonate of (recarbonated waste)** in packages or in bulk, C. L., min. wt. 50,000 lb. W. D. A. 62058, D. B. 3032,

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Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason: No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

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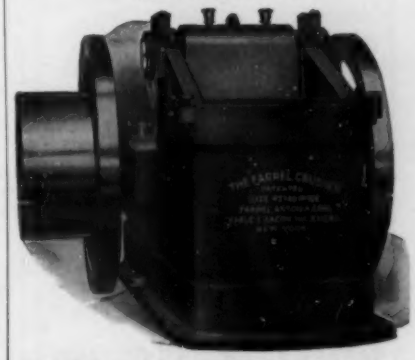

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dated March 25th, covering proposal to establish rate of 14c on, from Wyandotte, Mich., to Chillicothe and Franklin (Warren Co.), Ohio, is hereby amended providing for addition of following therein: from Akron, Ohio, to Franklin Ohio, 13c; Barberton, Ohio, to Franklin, 13c; Fairport Harbor, Ohio, to Chillicothe, 14c; Painesville, Ohio, to Franklin, Ohio, 14c.

62115 (1). **Sand and gravel.** Cancel the following commodity rates published in C. F. A. L. Trf. 155-U; Sand (except industrial, and gravel, from Edenburg, Harbor Bridge, New Castle and West Middlesex, Penn., to Sault Ste. Marie, Mich., 620c, and Sault Ste. Marie, Ont., 674c per net ton. Sand, industrial, to Duluth, Minneapolis, Minnesota Transfer and St. Paul, Minn., from the following Penn. points: Rate — Harbor Bridge, 503c; Hillsville, 503c; Mahoningtown, 503c; New Castle, 503c; New Castle Jct., 503c; Quaker Falls, 503c; Robinson, 503c; Shaw Junction, 503c; Wampum, 503c; West Middlesex, 503c; West Pittsburgh, 503c; Edenburg, 463c. And similar rates in individual lines' tariffs. Class rates to apply.

62130. **Sand, all kinds, and gravel,** C. L. establish on, from Glass Rock, O., to Black Fork, O., 127c in open top equipment and 146c per net ton in box car equipment.

62133, cancels W. D. A. 61278. **Lime, agricultural,** C. L. Establish on, from McVitty's, O., to Eaton, O., 11c. min. wt. 50,000 lb., and 14c, min. wt. 30,000 lb., applicable only on Ohio intrastate traffic.

62153. **Sand, all kinds, and gravel,** in open top cars, C. L. Establish on, from Rittenours, O., to Philo, O., 127c per net ton.

62154. **Limestone ground or pulverized,** unburnt, C. L., min. wt. 60,000 lb. Establish on between the following Indiana points: From Speed to Bicknell, 176c; Clinton, 193c; Midland, 176c; Black Hawk, 182c; West Terre Haute, 193c; Clay City, 187c; Buckskin, 165c; Latta, 176c; West Clinton, 204c; Evansville, 176c; Seifert, 187c; Dugger, 176c; Cool City, 182c; Terre Haute, 193c; Booneville, 165c; Brazil, 182c; Oakland City, 165c; Cass, 176c; Princeton, 165c; Wheatland and Elberfeld, 176c per net ton.

62186. **Slag** (refuse product of lead or zinc furnaces, having no commercial value for the further extraction of metal), C. L. Establish on, from Chicago, Ill., to Kalamazoo, Mich., 8c.

62201. **Sand** as per Descriptions a, b and c, C. F. A. L. Trf. 575. Establish on, from Ottawa-Utica, Ill. Dist. to Bassett, Va., (a) 429c; (b) 472c and (c) 429c per net ton., via C. B. & Q. R. R. or C. R. I. & P. Ry., Chicago, Ill., P. R. R., Cincinnati, O., N. & W. Ry.

62203. **Lime,** common, hydrated, quick or slaked, C. L. Establish on, from Manistee, Mich., to Port Huron, Mich., 17c, min. wt. 30,000 lb. and 13c, min. wt. 50,000 lb., via P. M. Ry. direct.

62208 (2). **Unburnt ground or pulverized limestone,** C. L., min. wt. 60,000 lb. Establish on, from Gibsonburg, O., to N. Y. destinations, viz.: Bemus Point, Bonita, 193c; Brocton, N. Y., 204c; Cassadaga, 209c; Cattaraugus, 237c; Cherry Creek, Conewango, Dayton, Dunkirk, 215c; Falconer, 193c; Fredonia, 209c; Frewsburg, 193c; Kennedy, 209c; Lakewood, 193c; Little Valley, 237c; Mayville, 193c; Nixon, 198c; Panama, 193c; Perrysburg, 215c; Portland, 198c; Randolph, 215c; Red House, 220c; Ripley, 198c; Sheridan, 215c; Sherman, 193c; Silver Creek, Smiths Mills, 215c; Steamburg, 220c; Summerdale, 193c; Van Buren, 215c; Watts Flats, 193c; Westfield, 198c, and Woleben, 215c per net ton.

62211 (1). **Stone,** crushed; slag or gravel, coated with oil, tar or asphaltum (see note 7), in open top equipment, C. L. Establish on, from Grand Rapids, Mich., to Alma, 156c; Carsonville, 244c; Caro, 207c; Coldwater, 194c; Dowagiac, 156c; Hillsdale, 168c; Lapeer, 194c; Marshall, Mason, 156c; Midland, 207c; Mt. Pleasant, 194c; New Buffalo, 168c; Paw Paw, 156c; Pigeon, 219c; Port Huron, 207c; and Three Rivers, Mich., 156c, net ton.

Trunk

38789 (shippers). **Sand** (industrial) and **gravel,** in open top cars without tarpaulin or other protective covering, C. L. (See Note 3), etc., from Cleveland, Ohio, to Cincinnati, Ohio, $3.41; Columbus, Ohio, $2.97; Dayton, Ohio, and Wilmington, Ohio, $3.19; Erie, Pa., $2.20, and Cleveland, Ohio, $2.53 per net ton (See Note 5).

38678. **Limestone** other than ground or pulverized, C. L., from Myerstown, Penn., to Mahwah, N. J., 176c per net ton, in lieu of current 6th class rate of 21c per 100 lb. (See Note 5).

Southern

22115. **Sand and gravel,** C. L. Establish 90c net ton, Hattiesburg, Miss., to Griggsby Ferry, Carthage and Edinburg, Miss. Truck competitive. Expires June 30, 1941.

22136. **Crushed stone,** C. L. Establish 40c net ton, Rockmart, Ga., to Rome, Ga.

22152. **Limestone,** ground or pulverized, C. L., min. 80,000 lb. in closed cars and 170,000 lb in open top cars. Establish 136c net ton, Mascot, Tenn., to Greenville & Northern Ry. stations.

22166. **Phosphate rock,** C. L. Establish 281c net ton—Mt. Pleasant, Tenn., to Masonville, Ky. Truck competitive.

Illinois

2491-4 (I. R. C.). **Fluxing stone,** C. L., (See Note 3.) but not less than 60,000 lb., from Linwood, Ia., to Sterling, Ill. Present—$1.11 net ton. Proposed—97c net ton.

IRC 7894-10. **Agricultural limestone,** as described in Section 3 of tariff, min. wt. as shown in Rule 5, from Thornton, Ill., to Coleman, Ill. Present: 66 per net ton. Proposed—50 net ton.

IRC 8587-2. **Sand,** industrial, C. L., from Ottawa and Wedron, Ill., to Marengo, Ill. Present—$1.52 net ton. Proposed—$1.42 net ton.

Fluxing Stone Rates Declared Prejudicial

REMOVAL of undue prejudice found to exist in rates on limestone fluxing material from Lawrence, O., to Farrell, Sharon and Weirton, Penn., and Wheeling, W. Va., has been ordered by the I. C. C., division 2, in No. 38303, Ohio Calcium Co., Inc., vs. B. & O. et al. The Commission found the assailed rates from Lawrence were and for the future would be unduly prejudicial to the complainant to the extent that they exceeded or might exceed corresponding rates contemporaneously maintained for application on roasted calcite from Martinsburg and Millvale, W. Va., to the destinations named.

The report said the average of the rates for application on fluxing lime from Lawrence was $2.64 a ton, whereas from Martinsburg and Millvale the corresponding rates on roasted calcite averaged $2.38 a ton.

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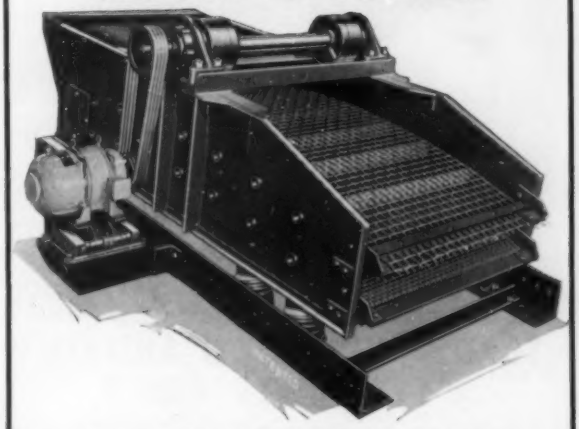

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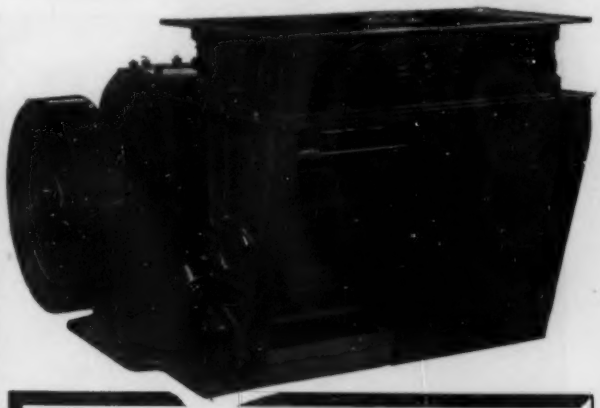

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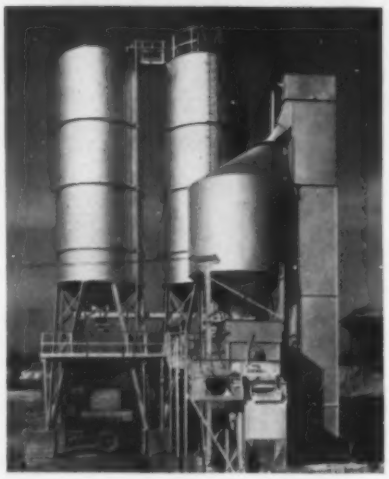

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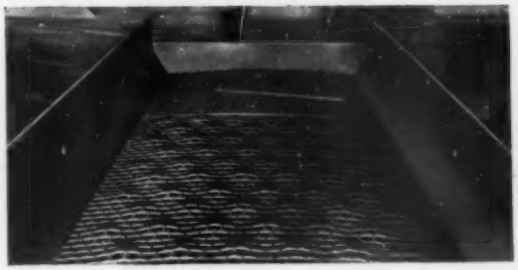

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PRICES BID
Contracts Let

PROVIDENCE, R. I.: M. A. Gammino Construction Co. submitted a low bid on crushed stone to be used for the coming year as follows: 2½-in., $1.44 per ton; 2-in., $1.44; 1½-in., $1.24; 1¼-in., $1.24; 1-in., $1.24; ¾-in., $1.54; ½-in., $1.64; ⅜-in., $1.64; and screenings, 84c per ton. Quotations include delivery on the job.

•

KANSAS CITY, MO.: Contract has been let to Flynn Construction Co. for 4000 tons of crushed rock at $1.44 a ton and to the Welch-Sandler Co. for 5000 tons of sand at $1 a ton.

•

ROBESONIA, PENN.: Berks Products Co., Reading, was awarded the contract for crushed stone needed by the Borough during the year at $1.40 per ton on the job.

•

KNOXVILLE, TENN.: The Tennessee Valley Sand & Gravel Co., Sheffield, Ala., was awarded a contract for 15,000 tons silica gravel at 60c a ton to be used by the Department of Chemical Engineering of the T.V.A.

•

LAWRENCE, MASS: General Crushed Stone Co., Winchester, was low bidder on No. 1 and No. 2 crushed stone to be used in local projects with a bid of $1.50 a ton.

•

TIFFIN, OHIO: Two firms submitted bids for crushed stone to be used on Seneca county highways during 1940. France Stone Co. bid 90c a ton on Nos. 1, 2, 7, 9 and 11; $1 a ton on Nos. 3, 34, 46 and 3A; $1.10 a ton on No. 6; and $1.50 a ton on 6B and 9C. Basic Dolomite, Inc., bid 90c a ton on Nos. 1 and 2; $1 a ton on Nos. 3, 4, 5 and mixed aggregate; $1.10 a ton on No. 6; 75c a ton on No. 7; 25c a ton on No. 00; and 40c a ton on No. D-8.

•

MANCHESTER, N. H.: The Highway Commission voted to award the contract on sand and gravel for one year starting April 1 to Vogel and Hadley, whose bid included the following: Sand at 85c a ton, washed sand at 85c a ton, bank run gravel at 85c a ton, crusher run gravel at $1.25 a ton, 1-in. crushed stone at $1.60 a ton, 1¼-in. stone at $1.30, 2-in. stone at $1.30, tailings at $1.50, 1¼- and 1½-in. screened gravel at $1.30, stone dust at $1.00, 1- and 1½-in. stone at $1.30, crushed grit at $1.60, and screen grit at $1.30 a ton.

•

FULTON, MO.: Auxvasse Quarry Co., Auxvasse, Mo., is furnishing agricultural limestone at a price of from $1.75 to $2.25 a ton based on the haulage distance of the delivery. The price includes delivery and spreading.

Friant Dam Contracts Let

CONTRACTS for furnishing 1,650,000 bbl. of cement for construction of the Friant Dam, near Fresno, Calif., have been divided among three companies. Calaveras Cement Co. obtained the largest portion, 800,000 bbl.; Pacific Portland Cement Co. will furnish 503,000 bbl. and Yosemite Portland Cement Co., will furnish 347,000 bbl.

The value of the contracts was not disclosed, but it was stated that the successful bids were "very low." The bids by these companies reported in ROCK PRODUCTS for May, p. 80, were: Calaveras, 90c, with no discount, on 150,000 bbl.; Pacific, $1 less 10 percent, 10 days on 330,000 bbl.; and Yosemite, $1.016 on 350,000 bbl.

Delivery is tentatively set to start June 15, but it is believed that preliminary work at the dam may cause large scale cement pouring to be delayed until about the middle of September.

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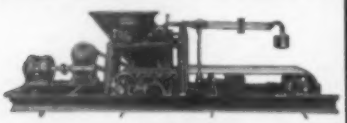

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Schaffer Poidometer Co.

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More About People

(Continued from page 48)

S. H. COWELL, president of the Henry Cowell Lime & Cement Co., A. K. Humphries, president of Pacific Coast Aggregates and George R. Ray, vice-president of Santa Cruz Portland Cement Co., were members of the sponsoring committee for the Northern California Industrial Leadership Conference held May 16 at the Palace Hotel in San Francisco.

•

HARRY HOLLEY has become sales manager of the block department of Concrete Products and Materials Co., Omaha, Neb.

•

HOWARD M. ZOERB, chief engineer of the crusher division of Nordberg Mfg. Co., Milwaukee, has returned from a five months' trip in Central and South America during which time he flew 11,000 miles and traveled another 7000 by train, boat and horseback.

•

MRS. G. C. SPENCER, widow of the late W. M. Spencer, is now president of the Kansas City Quarries Co., Kansas City, Mo., and H. C. Blue is secretary, treasurer and general manager.

OBITUARIES

FREDERICK CALVIN PARSONS, sales manager since the organization of the Volunteer Portland Cement Co., Knoxville, Tenn., 12 years ago, died May 9. He attended North Carolina State College, was sales manager for Atlas Portland Cement Co. at Savannah, Ga., later was with Standard Oil Co. at Greensboro, N. C., and was with Atlas Portland Cement Co. in Birmingham just before he joined the Volunteer company.

•

JOSEPH FRANCIS KELLY, official of the Mickum & Kelly Sand and Gravel Co., Portland, Ore., died May 6 at the age of 83.

•

ROBERT BURNS HENDERSON, president of the Pacific Portland Cement Co., San Francisco, Calif., died May 14. He was 63 years of age and had been president of the company since 1921. From 1910 until 1913 he was treasurer and until 1921 was general manager. He was also president of the Crocker Hotel Co. and of the St. Francis Investment Co., and an officer of the Crocker Estate Co. and of the Petroleum Rectifying Co. Mr. Henderson's varied interests were reflected in such positions as these held in his latter years: He was a vice-president of the National Association of Manufacturers, a director of the Golden Gate International Exposition and a director of the San Francisco Chamber of Commerce.

•

BRIG. GEN. OTTO H. FALK, chairman of the board of Allis-Chalmers Mfg. Co., Milwaukee, Wis., died May 21 at the age of 74. He also was an

Brig. Gen. Otto H. Falk

officer and director of many other corporations. Gen. Falk was appointed receiver for the Allis-Chalmers company in 1912, reorganized it as the Allis-Chalmers Manufacturing Co. and a year later was elected president.

•

FRANK XAVIER WACHTER, a director of the Monarch Cement Co., Humboldt, Kans., died May 3 at the age of 66.

•

J. A. ROCKWELL, vice-president in charge of sales of the Ash Grove Lime & Portland Cement Co., at Omaha, Neb., died recently.

•

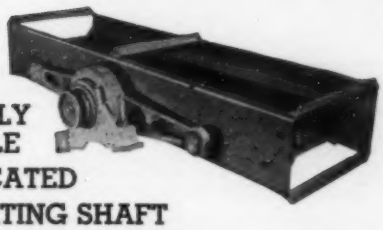
L. W. BARDT, since 1924, foreman on all the major construction and maintenance of the Granite Rock Co., Watsonville, Calif., died recently.

•

RALPH GILBERT SPENCER, JR., founder and former president of the National Lime and Stone Co., Findlay, Ohio, died May 14 at the age of 64. He organized the company in 1902 and retired in 1936. Mr. Spencer was also one of the organizers of the Federal Porcelain Co., which was merged with the Porcelain Products, Inc., Findlay, about ten years later.

•

N. D. MOORE, president and director of the Pacific Coast Cement Corp., Seattle, Wash., died May 18. He was also vice-president and general manager of the Pacific Coast Co.



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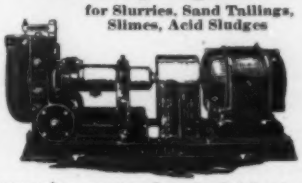

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AT LOWER COST

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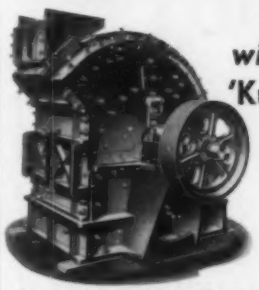

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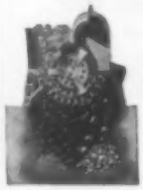

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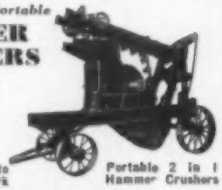
HAMMER CRUSHERS

Wide crushing range, crushes stone 2½" down to agriculture dust.



Ideal for Farm to Market Road Work

Portable 2 in 1 Hammer Crushers

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GRUENDLER CRUSHER & PULVERIZER CO.

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Likewise a vibrating screen must be sturdily constructed for endurance and simple in design to give satisfactory service because it, too, must "Take It" day after day.

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Write for illustrated catalog and prices.

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RACINE - - WISCONSIN

New Incorporations

Ready-Mixed Corporation, Gainesville, Fla., has been granted a charter. Capitalization is 250 shares at $100 par value. Directors are B. W. Kirk, T. S. Baker and W. A. Shands.

Andrea Corporation, Newburgh, N. Y., has been granted a charter with 200 shares no par value. Directors are Col. Raphael A. Egan, Arthur E. Kaley, Matthew R. Herbison and William A. Lahey.

Continental Vermiculite Corp., 3816 Grand Ave., Chicago, Ill., has been granted a charter. Capital is 10,000 shares, no par value, and incorporators are R. A. Scholz, M. M. Shearer and H. A. Shearer.

Southern Sand and Gravel Co., Vidalia, Ga., has been granted a charter.

Warren Crushed Stone Co., Bowling Green, Ky., has been incorporated by R. E. Gaddie and J. C. and Mattie Lou McLelland with a capital of $20,000.

Northville Sand and Gravel Co., Detroit, Mich., has been incorporated by Esther Selzer, 14900 Linwood Ave., with a capital of $50,000.

Manufacturers' News Notes

Davey Compressor Co., Inc., Kent, Ohio, announces appointment of Russel Coles as Great Lakes district manager and S. V. Saginor as production manager and director of parts and service.

Wickwire Spencer Steel Co., New York, N. Y., announces the appointment of A. S. Rairden as wire rope sales manager. For the past seven years as rope engineer he has functioned as contact between the sales and production departments.

Meckum Engineering, Inc., Chicago, Ill., is the name of a newly formed organization specializing in engineering and supplying dredge pump equipment. Its business will also be that of supplying an engineering service to sand and gravel plants relating to producing, washing and grading sand and gravel. J. W. Meckenstock is president and George C. Kumlin is vice-president and treasurer. Both have had extensive experience in this field.

SKF Industries, Inc., Philadelphia, reports that William L. Batt, president, was guest speaker at a luncheon held in New York on May 15 by the Technical Publicity Association in connection with a celebration of the Association's 35th anniversary. His topic was "Industry's Selling Job."

Part of the 3000 visitors who attended the Joseph T. Ryerson & Son, Inc., open house at its Chicago warehouse May 11. The large crowd, which included many out-of-town guests, witnessed the opening of the new steel building and went on specially conducted tours through the entire plant

Diamond Iron Works, Inc., Minneapolis, Minn., has appointed Frank P. Biancett sales representative, covering their dealer representation in Arizona, New Mexico, Texas, Oklahoma, Arkansas and Louisiana. His headquarters will be at the Clifton Hotel, Dallas, Texas.

McGann Manufacturing Co., Inc., York, Penn., announces that it has completed reorganization and is now ready to continue to serve lime producers with kilns, hydrators, dryers and other lime plant accessories. It has made arrangements with the Lime and Hydrate Plants Co. to manufacture their complete line of patented specialties for lime and hydrate plants.

Western Precipitation Corp., Los Angeles, Calif., has opened a sales and engineering office in the Marquette Bldg., Chicago. A. W. Robinson is in charge of operations in the central states

Harbison-Walker Refractories Co., Pittsburgh, announces the purchase of the Athens plant of the Athens Brick & Tile Co., Athens, Tex. The plant is now being operated as a unit of Harbison-Walker Refractory Co.

★ MANGANESE STEEL CASTINGS ★

for
CRUSHERS
PULVERIZERS
ROLLS
SCREENS

INDIAN BRAND

for
SHOVELS
DREDGES
CRANES
CONVEYORS

The Frog, Switch & Mfg. Co.

Established 1881 CARLISLE, PA.

PERFORATED METAL
SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1455

"PENNSYLVANIA" REVERSIBLE HAMMERMILL

A Revolutionary Development because:—

Major Reduction by smashing impact,—
Daily reversal automatically turns and resharpens Hammers and Cage Bars,—
Increased capacity and fineness,—
Lower Power demand per ton,—
Upkeep cost sharply cut,—
Twenty (20) sizes specialized for the varied needs of the Rock Products Industries.

PENNSYLVANIA CRUSHER COMPANY

PUT YOUR REDUCTION PROBLEMS UP TO US

Liberty Trust Bldg.
PHILADELPHIA, PA.

HAYWARD BUCKETS

USE RIGHT BUCKET FOR THE JOB

Hayward makes all four—clam shell, drag-line, electric motor, orange peel. A Hayward recommendation is unprejudiced.

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New York, N. Y.

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GYRATING SCREENS

The Leader in Improved Screening
Available in Many Standard Sizes
For Any Aggregate Grading Job

"It's Guaranteed, without Reservation"

SIMPLICITY ENGINEERING COMPANY
DURAND, MICHIGAN

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SPEED REDUCERS

All Sizes - Types - Makes
Conveying Equipment

SAVE 60% OF NEW COSTS

All Materials Overhauled, Guaranteed

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154 GRAND ST. NEW YORK

SLIP RING MOTORS
100 HP. 720. 3/60/220, Westinghouse CW.
150 HP. 720, 3/60/2200, General Elec. MT.
150 HP. 600, 3/60/220, Westinghouse CW.
400 HP. 600, 3/60/2200, Westinghouse CW.

SYNCHRONOUS MOTOR
220 HP. 900, 3/60/220, General Elec. ATI.

A. C. GENERATORS
150 KVA. 600, 3/60/240, General Elec. ATB.
300 KVA. 600, 3/60/240, General Elec. ATB.

GASOLINE GENERATOR
5 KVA. 3/60/220V. A.C. Generator—Le Roi eng.

DIESEL ENGINE
100 HP. Fairbanks-Morse type Y, style V.

TRANSFORMERS
3—100 KVA. 2200—110/220V. Gen. Elec. type A.

AIR COMPRESSORS
9x8 Chicago Pneumatic NSB 173 CFM. 100 lbs.
10x9 Sullivan class WG3 290 CFM. 100 lbs.
17 and 10x14 Ingersoll Rand Imperial type 10 two stage, 677 CFM. 100 lbs., complete.

Rockford Electric Equipment Co.
710 South Wyman St. Rockford, Illinois

FOR SALE
USED EQUIPMENT
10 x 20 DIAMOND Roller Bearing Jaw Crusher.
10 x 36 DIAMOND Roller Bearing Jaw Crusher.
15 x 36 DIAMOND Roller Bearing Jaw Crusher.
2'0" x 4'0" single deck DIAMOND vibrating screen.
6 to 8 HP model MRP3 LeRoi Engine.
Model No. U-40 Allis-Chalmers Engine.
4" Sterling Sand Pump No. 3558.
60" x 20'0" Revolving screen—Structural frame on wheels.

NEW EQUIPMENT
1—DIAMOND 9 x 16 Bronze Bearing Jaw Crusher mounted on truck with 15-20 HP engine.
3'0" x 8'0" Triple deck Diamond Vibrating Screen.
21-Cu. yard Jack Leg Bin.
Special Price for quick sale.

Diamond Iron Works, Inc., and Mahr Manufacturing Company Div.
MINNEAPOLIS, MINN.

Hydrate Plant Equipment
1—Kuntz 6 ton Continuous.
1—Clyde 6-8 ton Continuous.
1—Schultless 1 ton Continuous.
1—Schultless 2 ton Continuous.
All of the above with Kuntz Dust Control.
1—Complete Hydrate plant for double separation, 6-8 tons. This plant was replaced by a 10-12 ton per hour Kuntz System for triple separation.

LIME & HYDRATE PLANTS CO.
P.O. Box 574 York, Penna.

THESE columns offer you the best medium in the rock products industry for the sale exchange and purchase of used equipment, rock, quarry and gravel-pit property; the circulation and buying influence of Rock Products extends beyond those now actually engaged in operating plants; it includes mining engineers and capitalists who may be reached through no other medium, because of Rock Products' world-wide reputation as the BUSINESS JOURNAL of the rock products industry.

Partial Equipment List
C. S. Johnson 5 compt. bin 1000 c.y. automatic batchers.
1—Bin 3 compt. 140 ton Johnson, weighing scales.
15—Compressors 529'-2600' cap. Gas, Diesel, Electric drives, Stationary & Portable.
21—Boilers—20 to 150 H.P. Vertical & Horizontal —High Pressure.
60—Hoists; 1-2-3 drums,—steam, gas & electric.
5—Derricks—Steel Stiff Leg, 10-25 T. cap.
12—Locomotives, 8-40 T. Gas, Steam, all gauges.
30—Flat cars—36" gauge, 4 T. roller bearing.

Send us your inquiries
Rail and Rail Supplies

Coast to Coast Equipment Corp.
9 Rockefeller Plaza New York, N. Y.

ROTARY KILNS AND DRYERS FOR SALE

ROTARY KILNS

2—8′ x 125′
5—6′ x 120′
5—6′ x 60′

ROTARY DRYERS

1—4′6″x50′ Direct Heat, double shell type.
1—4′x60′ Direct Heat, with ½″ shell.
3—6′x60′ Direct Heat.

All of these Kilns and Dryers are complete and still in operating position in the plant of the former Castalia Portland Cement Co. that we purchased in its entirety. Castalia is 60 miles West of Cleveland, and inspection at the plant is invited. Each of the kilns is equipped with firing hood, pulverized fuel bin, feeder, etc.

BALL MILLS

2—5′x10′ BONNOT BALL MILLS, steel lined, each with 150 H.P. slip ring motor.
1—8′x30″ HARDINGE CONICAL BALL MILL iron lined, with motor.

TUBE MILLS

5—5′x20′ and 5′x22′ TUBE MILLS, silex lined, steel heads, each with 150 H.P. slip ring motor.
5—5′x27′ TUBE MILLS, silex lined, rolled mounted, each with 200 H.P. slip ring motor.

Some of the other good equipment still remaining at the Castalia Portland Cement Plant:

1—12′ dia′ Phillips & McLaren Dry Grinding Pan.
300—1¾ yd. Dump Cars,two-way, 36″ gauge.
4—18-ton Locomotives, Porter and Vulcan, 36″ gauge.
2—42″ Fuller-Lehigh Pulverizers, gear driven, incl. motors.
1—5-ton Traveling Crane, 70′ span, 300′ runway.
1—20-ton Browning Locomotive Crane.
800 Ft.—12″ and 1200 Ft. 9″ Screw Conveyor, all encased, various lengths.
Electric Motors: Total of 4000 Horsepower, incl. 6—200 H.P. and 7—150 HP., all 600 RPM, 3/60/440 volts.

Send for Printed Bulletin

JUST ANOTHER MONTH! This equipment at Ely, Minnesota, must be sold quickly:

1—24x36″ All Steel Jaw Crusher.
2—8x36″ Universal fine reduction type Jaw Crushers.
3 Sets of Crushing Rolls.
80 Electric Motors, all 3/60/440 volts.
1—458 CFM. I-R. Air Compressor, 100 lbs. Incl. motor.
1—7x6 I-R. Type ER-1 Air Compressor.
1—1¼ yd. Osgood Electric Shovel.
3—Rotary Dryers 4x30′, 4x40′, 5x30′.
3—Tyler Hummer Screens, 4x5′ and 3x5′.
4—3x6′ Sturtevant Moto-Vibro Screens, 2-deck.
1—4′x7′ Leahy Vib. Screen, double deck.
1—150 Amp. Lincoln Electric Welder, port.
1—No. 5 I-R. Drill Sharpener.
7 Bucket Elevators, various sizes, encl.

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15-16-17 PARK ROW — *Our Shops at Newark, N. J., cover eight acres.* — NEW YORK, N. Y.

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Attractive Prices

1—80 Ton American 0-6-0 Switcher.
1—75 Ton Baldwin 0-6-0 Switcher.
2—40 Ton American Saddle Tanks.
1—38 Ton Vulcan Saddle Tank.
1—38 Ton Porter Saddle Tank.
2—25 Ton Plymouth—Gasoline. Standard Gauge—Rebuilt

1—Marion 480 Combination Steam Shovel and Crane.
1—52-B Bucyrus Dragline 70 ft. Boom, Atlas Imperial Diesel Engine.
1—25 Ton Browning 8-C Steam Locomotive Crane.

Birmingham Rail & Locomotive Co.
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15 H.P. FBM. Oil Engine.....$175.00
27 HP. FBM. Oil Engine..... 375.00
40 HP. Full Diesel Engine..... 400.00
80 HP. Full Diesel Engine..... 700.00
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200 HP. FBM. Diesel Oil Engine. Generator, Switchboard—Very good.....2,900.00
240 HP. FBM. VA Diesel Oil Engine.... 4500.00
110 HP. Anderson Oil Engine..... 1,100.00
All Makes and Sizes, at Good Prices.
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Air Compressors.
No. 2 Williams Jumbo Jr. Hammermill.
1½ Yd. Koehring Shovel.
88 H.P. Caterpillar Diesel Engine.
Model 25 Parson 16 ft. Ditcher.
Model 42 Barber-Greene Bucket Loader.
Haiss Loader.
500 ft. of 36″ 7 Ply New Conveyor Belt.
500 ft. of 18″ 5 Ply New Conveyor Belt.
BLUE BALL MACHINE WORKS
BLUE BALL PENNA.

No. 10 & 25-S Kennedy, 7″ & No. 10 Newhouse.
9A, 9B, 10B, 12A, No. 32 & 36″ Telsmith.
Nos. 4 & 6 Traylor Gyratory Crushers.
10x18″ Webb City, 12x26″ Champion, 14x24″ Blrdsboro, 15x36″ Farrell, 24x36″ Carroll, 24x72″ & 60x84″ Traylor Jaw Crushers.
30x14″, 40x15″ & 54x24″ Crushing Rolls.
22x36″ McLanahan & S. B. R. Crusher.
2 Euclid/Trac-Trux, Pneu. Tires, Waukesha Engines, 8 yd.
2 Yd. Atlas—4 Yd. Western 36″ ga. Dump cars.
Page 1¾ Yd. Bucyrus Erie 3 & 5 yd. Diesel Electric Draglines.
90 HP Fairbanks Model 34B Diesel Engine.
110 HP Anderson "K" Diesel Engine.
Vibrating Screens—all makes and sizes.
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MID-CONTINENT EQUIPMENT CO.
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PROMPT DELIVERY

25 ton Plymouth Gasoline Locomotive, New 1932.
"5 ton Gasoline Locomotive Cranes, 4′8½″ Ga.
1 yd. & 1¼ yd. P & H Cranes & Draglines.
20″x200′ Sullivan Troughed Belt Conveyor.
80, 100, 120, 180, 240 HP Fairbanks Morse and Atlas Diesels. Generators if required.
180 HP Fairbanks Morse Dredge type Diesel.
Send for Bulletin 120
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ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locos, frogs and switches. Attractive prices quoted. Wire, write or telephone for quotations.

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Motors and Generators, A.C. and D.C., for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
Fort Wayne, Indiana

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1—6½-yd. Bucyrus 320-B Electric Shovel
10—20-yd. Magor air operated Dump Cars
12—50-ton Covered Hopper Cars

IRON & STEEL PRODUCTS, INC.
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41-B BUCYRUS-ERIE

Steam Shovel — 1¼ yd.
First-class condition.

J. T. WALSH
Brisbane Bldg. Buffalo, N. Y.

1′&H 750 Diesel shovel &/or drag. Also P&H 900. Loco. Cranes—Ohio 25 & 30 ton, Browning 15 & 35 ton.
P&H 600 crane, 40′ boom. P&H ⅝ yd. shovels. ⅝ Yd. Page bucket. Sturtevant 10′ Separator.
Loaders—Barber-Greene 42, Haiss Model 27.
Conveyors—24″x80′ & 60′, 24″x200′ Gas portable.
Coal Conveyor—Barber-Greene 30′ gas crawler type.
Screw Washer—24″x20′. Bucket elevator 16″x30′.
Screens—2 deck 5x10 Simplicity, 4x8 L-B, 3x8 Jigger.
Rolls—14x24, 18x24, 16x33. Jaw crusher—9x36.
James Wood, 53 W. Jackson Boulevard, Chicago, Ill.

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AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS

9—1—113 ton Blaw Knox; 2—85 ton Heltzel; 1—60 yard Butler V-60; 1—72 Blaw-Knox; 1—40 ton Butler V-40; 2—35 ton Blaw Knox; 1—20 ton Heltzel with Kron-dial scale. All above with or without volume or weigh batchers.

1—Bulk Cement Handling Plant with Johnson 300 bbl. bin. Jeffrey elevators, portable.

BUCKETS

26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.

6—Dragline: 1—1¾ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd Hayward; 1—⅝ yd. Page.

1—1⅛ yd. Pioneer Cableway Excavator bucket.

7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

CONVEYORS & ELEVATORS

4—Steel frame belt conveyors: 3—18" Barber-Greene 60', 45' & 24'; 1—National 18"x20'.

11—Bucket elevators: Rex and Weller, on chain or belt; all sizes.

CRANES, DRAGLINES & SHOVELS

1—Link Belt Mod. K-55 combination dragline and shovel Ser. No. 1698, gasoline power, 70' dragline boom, 2 yd. shovel frame.

1—Page, Model No. 411 Diesel crawler dragline, 70' boom, 2 yd. bucket.

1—P & H Model No. 650, Serial No. 4188, 65' boom; 1¼ yd. bucket.

1—Link-Belt K-42, combination shovel, crane and trench hoe. Serial No. 1285, 1¼ yd. shovel front, 60' crane boom.

3—Northwest, Model No. 105, Serial Nos. 2053, 1645 and 1522, 40' boom, 1 yd. bucket.

1—Link-Belt, K-1, Serial No. 1024, 50' boom, 1 yd. bucket.

2—Osgood Heavy Duty, Serial No. 2069 and No. 2087, combination 1 yd. shovel and crane, 40' boom.

3—Thew, Model "O" combination shovel crane and dragline, Serial No. 2801 and No. 2687, ¾ yd. shovel fronts, 40' crane boom.

1—P & H Model No. 206, 40' boom, ¾ yd. bucket.

1—Byers Bearcat, Serial No. 3299, 30' boom, ⅝ yd. bucket.

CRUSHERS

6—Jaw Crushers: 1—12 x 36" Champion; 1—12x30" Acme; 2—10x20" Climax No. 2½; 1—9x16" Telsmith No. 9A; 1—9x15 Champion.

3—Gyratory: No. 5 Gates; 1 No. 3 McCully; 1—No. 0 McCully.

1—Set of Allis-Chalmers, smooth type crushing rolls, 42x16".

DREDGE PUMPS

1—12" Merris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.

3—Belt Driven: 3—Morris Mang., 1—10", 1—8", 1—6".

HOISTS

1—2 yd. Thomas 2 speed Class L Cableway excavator hoist with 150 HP electric motor.

1—1 yd. Cedar Rapids 2 speed drag-scraper hoist with 50 HP electric or gas power.

TRACTORS AND SCRAPERS

14—2—Caterpillar D-8, Diesels with 13 yd. LeTourneau scrapers; 1—Allis-Chalmers mod. L, 12 ton crawler tractors with or without Baker bulldozer; 3—Allis-Chalmers mod. 75, 12 ton crawler tractors; 3—Caterpillar tractors; 1—mod. 65; 1—mod. 60, 10 ton; 2—mod. 30, 5 ton. 1 with derrick attachment; 1—Allis-Chalmers, model K, 8 ton tractor with Baker hydraulic bulldozer; 2—Linn; 2—Fordson, one with winch and one with derrick attachment.

WHIRLEY

1—Mod. 75 Wiley Whirley No. 2973, 20 tons cap., 75' boom, 3 D Clyde 80 HP elec. hoist and 20 HP elec. swinger, all complete. Perfect condition.

PLEASE SEND FOR COMPLETE STOCK LIST

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1306 Race St., Philadelphia; Phone Rittenhouse 4064 — 1119 S. Waukegan Ave., Chicago; Phone Nevada 2400 — P. O. Box 933, Pittsburgh; Phone Federal 2900

SCREENS: 4x8 2-deck Gyrex Vibrating
4x8 2-deck Perfex Heavy duty Shaker
4x5 1-deck Hummer Vibrating, V-16
3—4x8 1-deck Hummer Vib., 2-unit V-16
120 New 3x5 & 4x5 Ton-Cap. Screen Cloth
3x8 1-deck Link-Belt Vib., Belted
3x5 1-deck Multirap Vib., Belted
36" Telsmith Enclosed Rotary Grizzly

CONVEYORS: 12"-36" Belt—Idlers—Pulleys
12"x50', 12"x80', 24"x100', 24"x200', 30"x100', 30"x125', & Portable Types

CRUSHERS: 9x15, 9x16, 10x20, 12x18
24x36-B Jaw & 28x30 Robins Rolls

ELEVATORS: 24"x40', 20"x50', 14"x50'
10"x40' Continuous Bucket Inclined
10"x40' Chain. 6"x50' Enclosed Belt Casings, Drives, Pulleys, Buckets, &c.

RAIL EQUIPMENT: 16—24"-g. 1-yd. Cars
2—30"-g. Mercury Battery Locomotives
24" to 36"-g. Portable Cars & Track

COMPRESSORS: 45' and 173' Belted
12x12x12 Steam-Air Compressor, 1-R.

MISCELLANEOUS: ¾-yd. Erie Shovel Front
50 & 60-hp. Waukesha Gasoline Engines
2-Drum Stroudsburg Builders Gas Hoist
12 Centrif. Elec. & Belted Water Pumps
¾, 1, 1¼ & 2½-yds. Clamshell Buckets
12-KVA Generator Set, for Hummer Screens

G. A. UNVERZAGT
15 PARK ROW — NEW YORK CITY

Large Crushing Plant

66 x 84 — JAW CRUSHER

Secondary Crushers—Motors—Disc-crusher—Elec. Hoist—Conveyors—Elevators—Screens—Dust Collectors—Etc.

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1—Rex 2½-3 yard capacity truck mixer.
3—Ingersoll Rand Size "D" Wagon Drills complete.
1—Midwest 10 ton, 36" gauge locomotive with self starter.
1—Ingersoll Rand Size 8 AFV pump with 60 HP, A.C. 3-phase motor.
1—Ingersoll Rand Size 8 AFV pump with 75 HP, A.C. 3-phase motor.
1—Barber Green Model "N" conveyor gas engine or electric motor.
2—Four ton 36" gauge locomotives.
1—Ingersoll Rand type 34 Drill Sharpener.
1—Sullivan size DR-82 Drill Sharpener.
7—Chicago Pneumatic Model 52 Wet Type Sinker Drills.
1—Ingersoll Rand Size 14 AFV pump with 300 HP, A.C. 3-phase motor.
1—Marion Diesel Electric 1½ cu. yd. shovel.
Also: V shape cars, all sizes, pneumatic tools, generators, drill steel, etc.

E. B. KELLEY CO., INC.
4387 Vernon Blvd.
LONG ISLAND CITY, N. Y.

Concrete batching plant, 5 compts., 1000 yds. aggregates, 750 yds. cement, automatic weigh batcher.
Robinson bulk cement unloader, air.
225 bbl. Erie bulk cement plant, complete.
155 bbl. Fuller cement bin, electric batcher.
Blaw Knox 270 bbls. bulk cement plant, complete.
72 ton Blaw Knox steel bin, portable, 2 compts.
50 ton Blaw Knox steel bin, portable, 2 compts.
42 cu. yds. Beaumont steel bin, 2 compts.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Gyratory crushers: K.V.S. 20, 37-S, 49; Telsmith 32, SA, 8B; Traylor 8"; McCully 13", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36x48, 48x60.
Jeffrey Type A 20" x 24" pulverizer.
Apron feeders, 18"x6', 24"x6' 48"x14', 5'x15'.
Bucket elevator, 65', chain, buckets 24"x12"x17⅝".
Revolving screens, 72"x20', 72"x18', 60"x24'.
Robbins, 4x8 double deck Gyrex vib. screen.
Telsmith 4'x10' single deck vibrating screen.
Gayco 8 ft. air separator.
Whirley, 25 tons cap., 85' boom, electric.
43-B Bucyrus Erie Diesel 2 yd. shovel.
41-B Bucyrus Erie comb. crane and shovel. Steam.
50-B Bucyrus Erie steam shovel.
Browning 10 ton crane, gas, 40' boom.
Blaw Knox single line clamshell bucket, ¾ yd.
Haiss clamshell bucket, 1½ yd. rehandling.
Barber Greene conveyor, 24"x70'.
8 Barber Greene conveyors, 24"x25', type N.
Barber Greene conveyor, 18"x60'.
4 I. R. Wagon drills, FM-2, pneumatic tires.
I. R. quarry bar, complete with I. R. X71 drill.
Caterpillar tractor, Model 20, bulldozer, gas.
I. R. Model 50 Leyner drill sharpener.
Plymouth 24 ton std. gauge gas locomotive.
Plymouth 20 ton std. gauge gas locomotive.
Vulcan 6 ton 36" gauge gas locomotive.
Vulcan 4 ton 36" gauge gas locomotive.
Dredge pumps, 6", 8", 10", 12", 16".
8"x8" cent. Lawrence pump, portable, 35HP., gas.
8"x8" cent. Barnes pump, portable, 35 HP., gas.
6"x5" Lawrence pump, 20 HP., electric.
4"x4" cent. LaBour self priming pump, 15 HP.
Ing. Rand 315-A Diesel air compressor, portable.
Sullivan WK60 315 cu. ft. portable air compressor.
DeWalt Woodworker, 16" circular saw, electric.
Wodack "D" portable hand saw, circular, electric.
Stiff leg derrick, steel, 30 tons, 97' boom.
Steam hoist, 10"x12", 3 drums, Lidgerwood.
Stiff leg derrick, steel, American, 15 tons, 90' bm., with 3 drum American 125 HP electric hoist & swinger.
Clyde 3 drum electric hoist and swinger, 75 HP.
Lidgerwood, 2 drums, swinger, gas hoist, 75 HP.
Sauerman 4 yd. dragline hoist, 150 HP, electric.
Sauerman two drum dragline hoist, 75 HP, gas.

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245 "	26″	5	1/8″	1/16″	"
906 "	24″	5	1/8″	1/32″	"
298 "	24″	4	1/8″	1/16″	"
370 "	22″	8	1/16″	1/16″	Elevator
296 "	22″	8	Friction		"
1455 "	20″	5	1/8″	1/32″	Conveyor
403 "	20″	4	1/8″	1/16″	"
1738 "	18″	4	1/8″	1/32″	"
60 "	18″	8	1/4″	1/16″	Elevator
288 "	18″	6	1/8″	1/16″	"
712 "	18″	4	1/16″	1/16″	Conveyor
1096 "	16″	4	1/8″	1/32″	"
554 "	16″	4	1/16″	1/32″	"
738 "	14″	4	3/32″	1/32″	"
288 "	14″	4	1/8″	1/16″	"
110 "	12″	8	1/8″	1/16″	Elevator
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Index to Advertisers

American Cable Div.....
.....Inside Back Cover
American Chain & Cable Co., Inc. .....
.....68, Inside Back Cover
American Pulverizer Co..... 85
Anchor Concrete Machy. Co. 64

Babcock & Wilcox Co.....
.....Front Cover
Bacon, Earle C., Inc..... 83
Barber-Greene Co. 1
Besser Mfg. Co..... 58
Blaw-Knox Co. 79, 86
Bradley Pulverizer Co..... 87
Bucyrus-Erie Co. .....
.....Outside Back Cover

Caterpillar Tractor Co..... 16
Chicago Bridge & Iron Co.. 86
Chicago Perforating Co..... 91
Classified Advertising ...91-95
Cleveland Wire Cloth & Mfg. Co. 96
Combustion Engineering Co., Inc. 17
Commercial Shearing & Stamping Co. 66

Deister Machine Co..... 85
Dempster Brothers, Inc.... 71
Dixie Machinery Mfg. Co... 88

Eagle Iron Works..... 71
Ensign-Bickford Co. 98

Fate-Root-Heath Co. 72
Flexible Steel Lacing Co.... 79
Frog, Switch & Mfg. Co.... 90
Fuller Co. 89

Gardner-Denver Co. 80
General Excavator Co..... 87
Goodyear Tire & Rubber Co. 5
Gruendler Crusher & Pulv. Co. 90
Gulf Refining Co..... 9

Harnischfeger Corp. 86
Harrington & King Perf. Co. 84
Hayward Co. 91
Hazard Wire Rope Div.... 69
Heltzel Steel Form & Iron Co. 67
Hendrick Mfg. Co..... 86
Hercules Powder Co..... 12

Industrial Brownhoist Corp. 73
Iowa Mfg. Co..... 89

Jackson & Church Co..... 66
Jaeger Machine Co..... 85
Jeffrey Mfg. Co..... 89

Kent Machine Co..... 68

Leschen, A., & Sons Rope Co. 83
Lewistown Foundry & Mach. Co. 89
Lima Locomotive Works, Inc. (Shovel & Crane Div.) 76
Link-Belt Co. 79

McLanahan & Stone Corp.. 87
Marion Steam Shovel Co... 3
Mepham, George S., & Co.. 68

National Industrial Advertisers Assn. 97
National Supply Co..... 6
Nordberg Mfg. Co..... 89
Northern Blower Co..... 85

Owen Bucket Co..... 96

Pennsylvania Crusher Co... 91
Pioneer Engineering Works, Inc. 14
Plymouth Locomotive Wks. 72
Productive Equipment Corp. 89

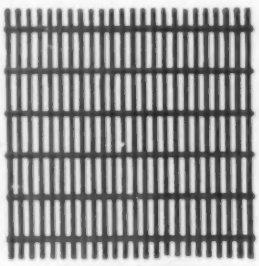
Ransome Concrete Machinery Co. 73
Raymond Pulv. Div..... 17
Robins Conveying Belt Co. 20
Roebling's, John A., Sons Co. 18, 75
Ross Screen & Feeder Co.. 83
Ryerson, Jos. T., & Son, Inc. 89

Sauerman Brothers 80
Schaffer Poidometer Co..... 88
Screen Equipment Co..... 84
Simplicity Engineering Co.. 91
Sly, W. W., Mfg. Co..... 74
Smidth, F. L., & Co..... 19
Smith Engineering Works..
.....Inside Front Cover
Stearns Mfg. Co..... 64
Sturtevant Mill Co..... 8
Superior Diesel 6

Texas Co. 4
Thew Shovel Co..... 13
Traylor Engineering & Mfg. Co. 7
Tyler, W. S., Co..... 79

Universal Concrete Pipe Co., Inc. 68
Universal Crusher Co..... 72
Universal Vibrating Screen Co. 90

Wall-Colmonoy Corp. 80
Western Precipitation Corp. 15
Wilfley, A. R., & Sons, Inc. 89
Williams Patent Crusher & Pulv. Co. 76



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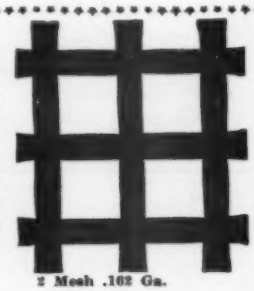
CLEVELAND SCREENS are star performers—returning larger capacities, increased profits and more accurate separations at lower cost. Cleveland Screens save money with the initial investment because, if they are made of the longer-wearing, wear-resisting ALLOY No. 2—Cleveland Screens stay on the job long after ordinary screens would have been replaced.

★ ★

THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 78TH STREET . . . . . CLEVELAND, OHIO



2 Mesh .162 Ga.

MORE PROFITS FOR YOU

Getting Salesmen's Co-operation

Tying in Advertising with Selling

Getting out into the field

Copy Testing

DIRECT MAIL

Layout, Copy and Illustration

Market Information

contributing to the solution of general company problems

Readership of Publications

Measuring Results

ALLOCATION OF BUDGETS

Programs that management will approve

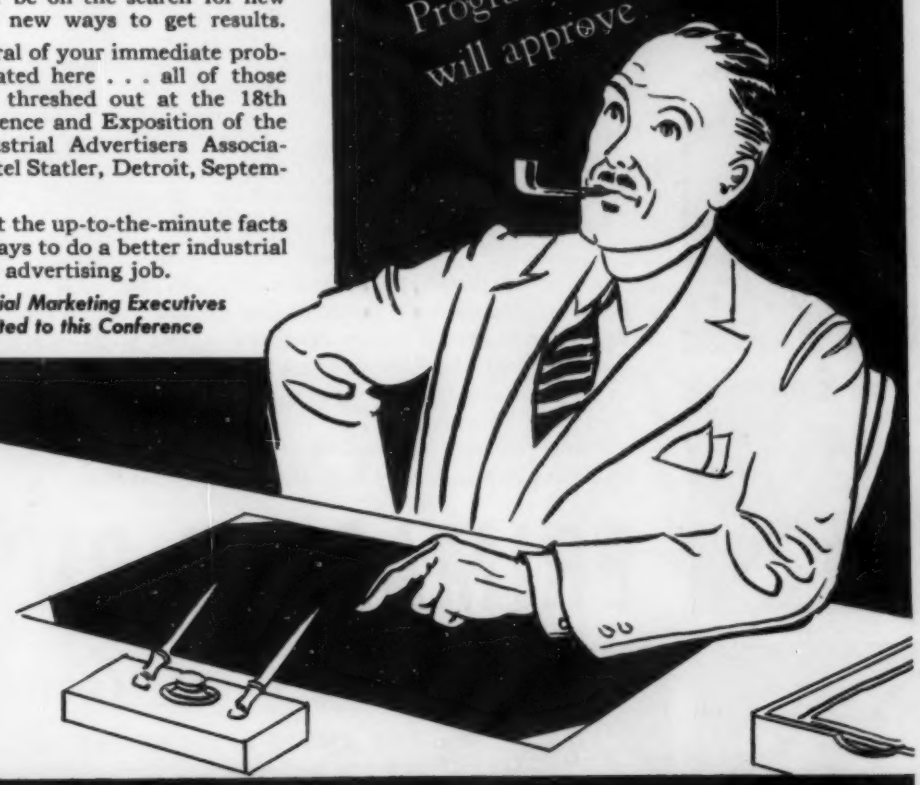
WHAT'S YOUR PROBLEM?

Your business . . . in at least one respect . . . is no different from others: *Your marketing problems are constantly changing.* You must ever be on the search for new ideas . . . for new ways to get results.

No doubt several of your immediate problems are indicated here . . . all of those shown will be threshed out at the 18th Annual Conference and Exposition of the National Industrial Advertisers Association, at the Hotel Statler, Detroit, September 18, 19, 20.

Plan now to get the up-to-the-minute facts on the latest ways to do a better industrial marketing and advertising job.

All Industrial Marketing Executives are Invited to this Conference



NIAA
NATIONAL INDUSTRIAL ADVERTISERS ASS'N.

1940 INDUSTRIAL ADVERTISING CONFERENCE

DETROIT . . . HOTEL STATLER . . . SEPTEMBER 18, 19, 20

CHOOSE IT *right*

Primacord
BICKFORD
DETONATING
FUSE
New Information on
Primacord
BICKFORD
Detonating Fuse
THREE TYPES NOW AVAILABLE
PLAIN—for practically all holes and for general use in connecting holes.
REINFORCED—stronger than double countered Cordeau, for use in deep holes where extra tensile strength or resistance to abrasion is desirable.
WIRE BOUND—for extremely caved-deep holes or where maximum resist
ance to abrasion is important.

Each of these three types of Primacord-Bickford Detonating Fuse has been developed to meet a particular need, as shown above. Check the job you have to do, and choose the right type of Primacord for that job.

Primacord carries a powerful detonating wave into each bore hole. Because Primacord is insensitive to friction, fire and ordinary shock, its storage, handling and hook-up are simplified; hazard reduced, economies effected, and greater efficiency obtained in large and intricate blasting operations.

We'll be glad to send you full information.

PRIMACORD·BICKFORD

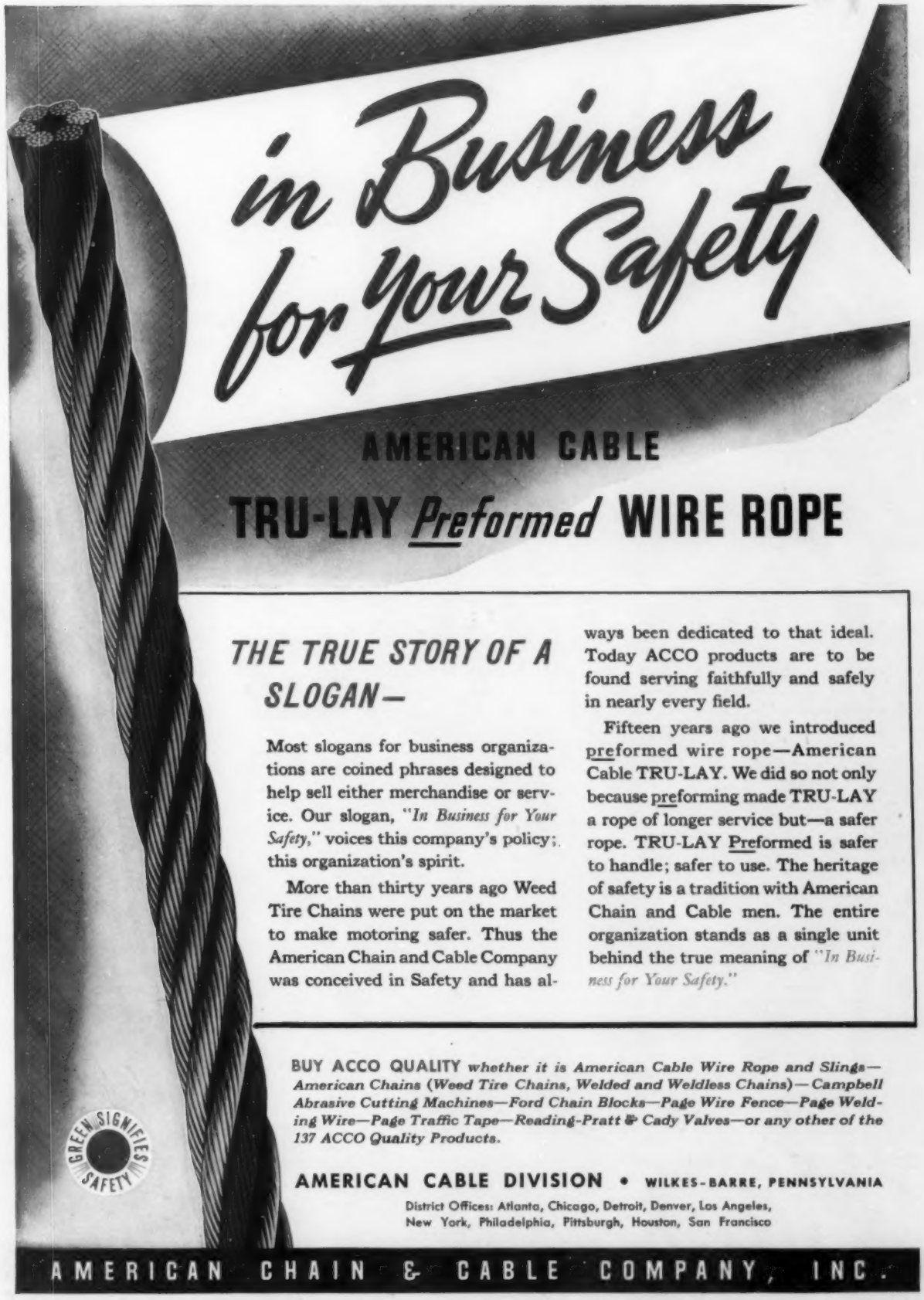
Detonating FUSE PB21

THE ENSIGN-BICKFORD CO., Simsbury, Conn.

Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836

1. Tie through cartridge.
2. Half hitch branch to main line.
3. Connect main line lengths with *square* knot.
4. Fuse and cap on end of main line.

Important: Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.



in Business for Your Safety

AMERICAN CABLE
TRU-LAY *Preformed* WIRE ROPE

THE TRUE STORY OF A SLOGAN—

Most slogans for business organizations are coined phrases designed to help sell either merchandise or service. Our slogan, "*In Business for Your Safety*," voices this company's policy; this organization's spirit.

More than thirty years ago Weed Tire Chains were put on the market to make motoring safer. Thus the American Chain and Cable Company was conceived in Safety and has always been dedicated to that ideal. Today ACCO products are to be found serving faithfully and safely in nearly every field.

Fifteen years ago we introduced preformed wire rope—American Cable TRU-LAY. We did so not only because preforming made TRU-LAY a rope of longer service but—a safer rope. TRU-LAY Preformed is safer to handle; safer to use. The heritage of safety is a tradition with American Chain and Cable men. The entire organization stands as a single unit behind the true meaning of "*In Business for Your Safety.*"

BUY ACCO QUALITY *whether it is American Cable Wire Rope and Slings—American Chains (Weed Tire Chains, Welded and Weldless Chains)—Campbell Abrasive Cutting Machines—Ford Chain Blocks—Page Wire Fence—Page Welding Wire—Page Traffic Tape—Reading-Pratt & Cady Valves—or any other of the 137 ACCO Quality Products.*

AMERICAN CABLE DIVISION • WILKES-BARRE, PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

AMERICAN CHAIN & CABLE COMPANY, INC.

M.M.P.

SAFETY *first* . . . ECONOMY *always*

with

BUCYRUS ERIE

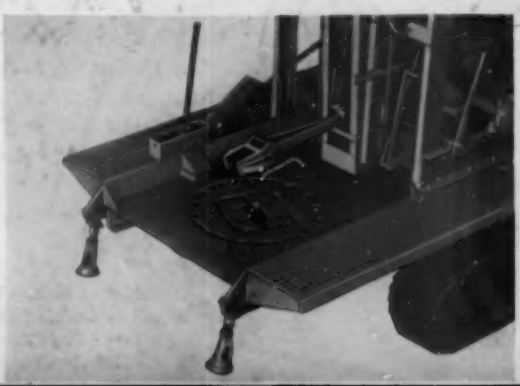
MODERN BLAST HOLE DRILLS

Operators "take to" the new large platform and built-in tool wrench found on modern Bucyrus-Erie blast hole drills. And well they should, for every thought for safety as well as efficiency was considered when Bucyrus-Erie engineers, with 73 years of successful drill designing to their credit, planned this new feature.

They built a large platform, big enough to allow ample room for a couple of pairs of husky shoes to keep out of the way of the bone-crushing weight of heavy tools. Pressed non-skid steel was used for the floor to give *better footing* than any pair of hob nailed boots—And the men work up off the wet ground and out of the muck.

Not only does this important improvement in blast hole drills make drilling safer, but it also makes it faster. The mechanical built-in tool wrench breaks tool joints quickly and eliminates all the back breaking labor and delay involved in handling heavy tool wrenches. This new turning wrench, driven by a bevel-gear drive beneath the operator's platform, is operated by means of an easily worked hand-lever ratchet on the operator's platform (by power on the 42-T). A holding wrench is hinged within the derrick-foot so it can be quickly and easily swung down for use. A common nail serves as a shear pin—when this snaps the joint is tight enough; thus, accurate setting of tool joints is assured.

Built-in tool wrenches are now available on the complete line of Bucyrus-Erie blast hole drilling equipment —the 27-T, 29-T, and 42-T. See for yourself how you can speed up your work, keep sharper tools on your rigs, and help satisfied operators to get the maximum output from modern Bucyrus-Erie drills. Investigate your drilling costs NOW. You'll find modern Bucyrus-Erie drills can save you money.



Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

MAY 1 1941